

# **Technological Spin-Offs as a Corporate Performance Instrument**

by

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## **Short Bio**

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## Abstract

The competitiveness and ferocity in the global markets have pushed companies to new investments in innovation strategies, attempting a sustainable guarantee and distinguished advantages over their competitors. Within this path new technological opportunities, which do not belong to the core business of the company, will eventually be created. These technological opportunities cause difficulties and challenges on how to generate value from them.

The literature has highlighted the importance of the technological *spin-offs* as a particular type of instrument that can be used by companies in order to take advantage of the discovered technological opportunity, conceding in this way economical and social benefits. Despite the quality and quantity of research in this area, these are essentially theoretical/conceptual nature, being rare empirical studies, especially from companies located in countries of intermediate development as is the case of Portugal, where the themes of innovation, entrepreneurship of science base and technology have in recent years been central in discourses (but maybe not so much in the actions) of political authorities and companies.

The objective of this dissertation proposal is to study the process of emergence of Technological spin-offs. In this way our goal is to analyze the Spin-Off as a corporate/management performance instrument, while assessing their economic and financial impact at the level of the host company. As a basis for the study were selected 4 companies listed in the Portuguese PSI - Martifer; EDP-Energias de Portugal, Galp-Energia, SGPS, Sonae - involving different scales/dimensions, different geographical locations and lines of business. This selection is characterized by having in the recent years by the adoption of different trajectories and strategic options.

Drawing primarily on data contained in the Annual Reports of the selected companies, we performed a content analysis of the strategies adopted and a preliminary quantitative analysis of the respective economic and financial performances. This detailed analysis allowed withdraw the following main conclusions: 1) (technological) spin offs are indeed an instrument of corporate management; 2) technological spin offs per se do not determine high host company performance; 3) technological spin offs do impact on host company performance when sustained in human capital drivers; 4) business experience and sector of activity matter for the impact of spin offs on host company performance; 5) the existence of complementarities among host company business segments and the investment driver stand as critical explanatory factors for the impact of spin offs on host company performance.

Keywords: Technology, Spin-offs, Economical performance.

JEL-Codes: O32; M13; L25

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## Introduction

Market competitiveness has a critical dimension for almost all type of businesses (Zott and Amit, 2008). Globalization has brought an all new set of challenges to companies (Kalish *et al.*, 1995). Shareholders increasingly demand for larger revenues. Given the emergence and development of BRICs' (Brazil, Russia, India and China) companies, which now compete in the same markets, with cheaper offers (although they are not as technologically advanced yet), western companies face new and fiercer competitiveness challenges (Bird, 2006). Along with these threats large companies face the rise of smaller companies which present alternative proposals through different business models and through innovation, challenging the incumbents (Zahra, 1996; Agarwall *et al.*, 2004; Rohrbeck *et al.*, 2009).

This dynamic and competitive environment fostered western companies to seek and to gain extra advantages through investments in R&D (Zahra, 1996). This path led to new technological breakthroughs, which often do not belong to the core business of the company (Chesbrough, 2003; Agarwall *et al.*, 2004). As consequence, the new technologies that cannot be used tend to be spilled out into an external environment or even lost, if the company does not find a way to profit from them (Zahra, 1996; Chesbrough and Rosenbloom, 2002; Chesbrough, 2003; Agarwall *et al.*, 2004; Klepper and Sleeper, 2005; Narayanan *et al.*, 2009).

In face of a technological discovery, corporations management have at their disposal some alternatives/ instruments in order to transform the new technology into economic value (Zahra, 1996; Chesbrough and Rosenbloom, 2002; Chesbrough, 2003; Clarysse *et al.*, 2005; Rohrbeck *et al.*, 2009): 1) do nothing and hope that the new technology could be used later on; 2) incorporate the discovery into the current core business; 3) try to create, within the firm, a new business 'line' and therefore increase the company's product/service diversity; 4) seek to sale or license the technology to other firms, guaranteeing some returns; and 5) use corporate venturing mechanism through a company's spin-off that will develop and commercialize the discovery.

The importance of the spin-off process and the benefits that are generated to society such as employment, technology improvement and economic growth are unquestionable (Zahra, 1996; Chesbrough, 2003, Agarwall *et al.*, 2004; Klepper and Sleeper, 2005; Zahra *et al.*, 2007; Narayanan *et al.*, 2009). According to Zahra *et al.* (2007: 569),

“corporate *spin-offs* (CSOs) represent around 12.9% of new firm formation in Europe, producing an above average net employment growth of at least 8%”. This trend is aligned with the researchers’ belief that *spin-offs* contribute significantly to the development of a company’s corporate strategy, through the creation of new value offerings or new capabilities in the form of knowledge, by fostering strategic changes and by increasing the corporation growth in all markets where the corporation is doing business (Narayanan *et al.*, 2009).

The importance of innovation and technological discovery, as well as the benefits that are generated to the economy and society, have been object of interest and deeply researched by the scientific community in the last few years. This research has been mainly centred in the knowledge transferred between public institutions (e.g. Universities, incubators, or science parks) and private in the form of start-ups or by selling or licensing the universities intellectual property rights to companies (Rothaermel *et al.*, 2007; Cleyn and Braetn, 2010). Rothaermel (2007) argues that this academic movement and the rise of venture capital, taking advantage of science knowledge, have been largely encouraged by the Bayh-Dole Act.<sup>1</sup>

The increased importance of knowledge transfer has also emphasized the outlook of spin-off phenomenon as an important management instrument (Parhankangas and Arenius, 2003). Consequently, this led to an intensification of the research on financial externalities, specifically the performance impact generated by the venture mechanism (i.e., the spin-off).

The literature has highlighted the importance of a particular spin-off - technological spin-off -, with more knowledge and skill based. And in this way, it has a higher capacity to generate an economical impact along with social benefits. According to Chesbrough (2003: 404) “[a] technology spin-off company is a particular type of spin-off company ... that is created for the purpose of commercializing one or more research discoveries outside the main business of the firm”. Such discoveries give companies the opportunity to expand their business into different areas. In some cases, through the creation of new products increasing the economic performance of the corporation and,

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<sup>1</sup> The Bayh–Dole Act (P.L. 96-517, Patent and Trademark Act Amendments of 1980) is United States legislation created to deal with the inventions made under federally-funded research programs, given small business and non-profits organizations like universities intellectual property control over their inventions and other intellectual property that resulted from such funding. This legislation was created specially as instrument of technology transfer between universities and private ([http://www.autm.net/Bayh\\_Dole\\_Act.htm](http://www.autm.net/Bayh_Dole_Act.htm), accessed 7 January of 2012).

therefore, bringing more value to the stakeholders (John and Ofek, 1995; Zhara *et al.*, 1995; Zahra, 1996; Martin and Sayrak, 2003).

From the discussion on spin-offs, two types of theoretical approaches are identified: one, more managerial focused, and the other more economic based. For instance, authors in line with Chesbrough (2003, 2002), Rohrbeck *et al.* (2009), or Zahra and George (2002), following a managerial line, analyse the linkage between the spin-off and the value creation from different perspectives, like: 1) the technology potential and appropriability, 2) the market forecast influence, 3) the localization conditions that foster the technology irruption, 4) the human capital and the organization identity existent in the company that influences the overall behavior, 5) the knowledge transfer and the intellectual proprietary rights management, and 6) the business strategy behind the spin-off. They argue that the success of a spin-off can be deeply influenced by several conditions, but, despite that, the opportunity and value generation that could emergence is very high. Authors like Cusatis *et al.* (1993), John and Ofek (1995), Martin and Sayrak (2003), Rovetta (2006), or Harris and Glegg (2008), more in line with an economic line, assess the performance impact of the spin-off creations in the companies' stock market. The authors argue that a positive influence will appear due to several factors, like: 1) the decrease of the asymmetric information between market and organization, 2) the reorganization of the corporation, 3) the refocus strategy that typically are behind the spin-off, and 4) increase of efficiency on the corporation value chain.

However, the existing scientific research is still vague and blurred about both of the motivations that could lead to the creation of a corporate spin-off and its corresponding success conditions (Lindholm Dahlstrand, 1997; Davenport *et al.*, 2002; Sapienza *et al.*, 2004; Klepper and Sleeper, 2005).

The goal of the present dissertation is to study the process of emergence of technological spin-offs. Analyzing them as corporate/management performance instruments and to assess their economic and financial impact at the level of the host company, contributing in this way to add fresh and additional evidence on the theme.

This dissertation is structured as follows. In Chapter 1 we revise existent literature on theories and determinants of a spin-off, deepening the analysis of existent articles about the process decision and the performance that is expected to happen. In Chapter 2 we detail the methodological considerations of the study. The in-depth analysis of the case

studies selected is presented in Chapter 3. Finally, in Conclusions, we summarize the main outcomes of the research and put forward the limitations of the present research and the main avenues for future research.

# **Chapter 1. A critical review of the literature on technology spin-off as performance instruments**

## **1.1. Initial considerations**

This section performs a critical review of the existent literature on the spin-off's topic, with special incidence on the impact of technological discovery in the process and the opportunity that could come to incumbent companies.

The present dissertation analyses the economic and financial benefits of a spin-off to the parent company, presenting the factors that can influence the decision and the performance behavior of this instrument. For this reason, the literature review undertaken, covers the different point-of-views existent among the scientific community (economic and managerial), and that fosters the understanding of the spin-off phenomenon.

In this way this section details the process of a corporate spin-off creation, organizing the literature according to a simplified model that explains the creation. The simplified model, based on several existent models, considers that a spin-off emergence depends on the following three major vectors; 1) firms, 2) decision process, and 3) performance.

Before detailing each vector of the process of spin off creation, the next section (Section 1.2) presents a brief and preliminary bibliometric analysis that helped to sort out the relevant literature underlying the analytical model proposed (Section 1.3).

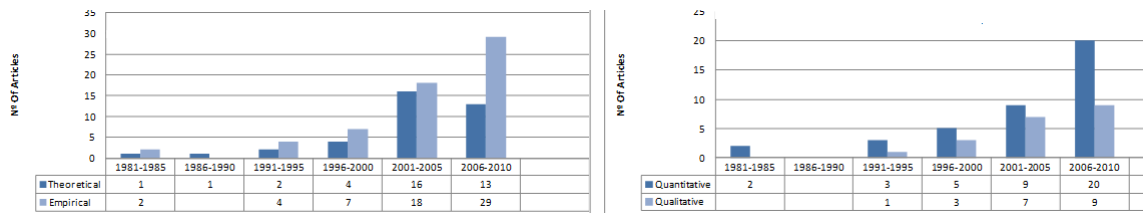
## **1.2. Corporate spin offs: a preliminary bibliometric analysis**

The literature on technology transfer and commercialization has observed a huge development in the last decade (Rothaermel *et al.*, 2007) being quite wide span and diverse (Cleyn and Braetn, 2010).

In order to obtain an integrated overview of the literature we performed a brief bibliometric exercise by searching in the bibliographic database Scopus® with the keywords 'Spin-Offs' and 'Performance', which returned 168 results.

The organization of the existing literature involved a classification based on the type of research (theoretical versus empirical), the unit of analysis (micro, meso, macro), country(ies), the methodology applied - in the case of empirical research, if it involved a quantitative or qualitative method -, and the topic or field of study.

In Figure 1, it is depicted the literature evolution over the time from 1981 until 2010 in sets of five-year periods. Despite the topic having already some years in the literature, it has been subject of increase interest and research in the last decade. This evidence is in line with the arguments of authors like Davenport et al. (2002), Rothaermel *et al.* (2007), or Narayanan *et al.* (2009). In empirical papers the proportion of quantitative methodologies used is always higher than the qualitative. This fact can be explained by pursuit to prove the advantages that the spin-off can bring to the economy.



**Figure 1: Evolution of the literature on 1981-2010 and the distribution of empirical research methodology**

*Source:* Author's computations based on papers gathered from Scopus®

The existing literature describes different models that aim at explaining the process of *spin-offs* creation. The model by Ndonzuau *et al.* (2002) provides a general framework; being composed by four successive stages, which according with the authors are “not wholly independent of each other”. The model is characterized by the following stages; 1) generation; 2) finalization; 3) spin-off launch; and 4) spin-off strengthen.

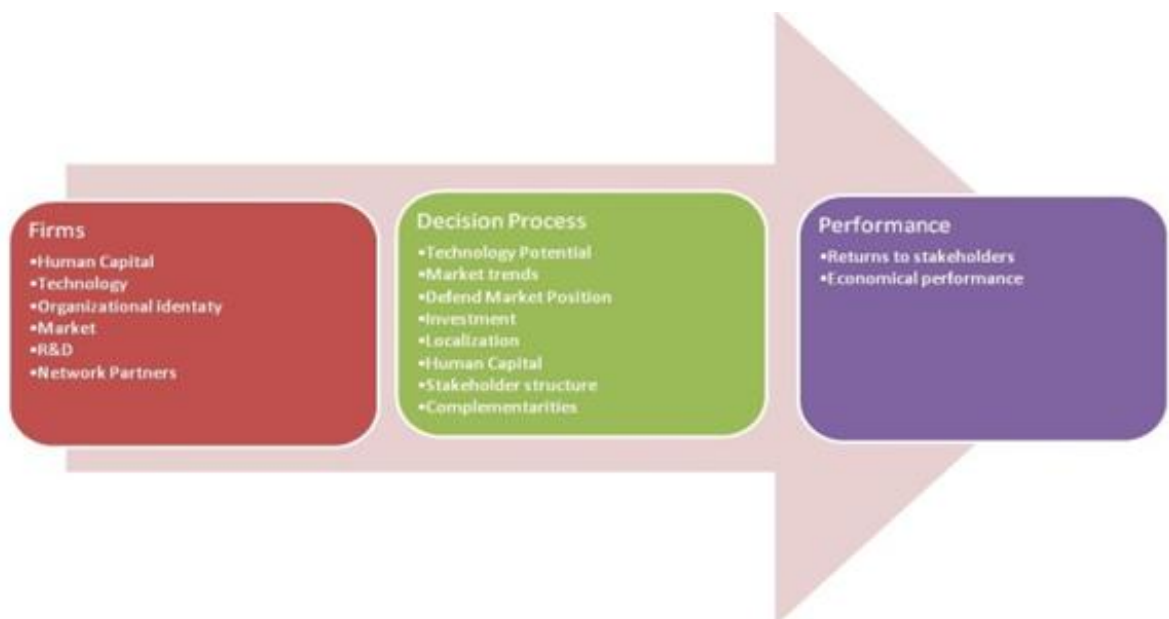
The first phase, the generation of ideas, results typically from the knowledge, in its different forms (codified or tacit). The second phase of the model, the selection mechanism, is where the ideas are selected by the opportunity and value recognition. The belief that an idea will generate value is what fosters a spin-off creation. The third step in the model is where the idea takes form and projects itself into a company. And finally, in the last step, the model predicts the strength of the company that depending on the model is the outcome of the product's commercialization (Cleyn and Braet, 2010).

A more complex model is the one by Hindle *et al.* (2004), following a linear form of previous models taking into consideration the peripheral aspects, like the individual knowledge and entrepreneurship, research support, technological opportunity, and the investment made by venture capital (Cleyn and Braet, 2010). However, the model proposed by Hindle *et al.* (2004, in Cleyn and Braet, 2010), does not consider the

process of developing or addressing the market. Further, the model does not include feedback loops in the spin-off creation.

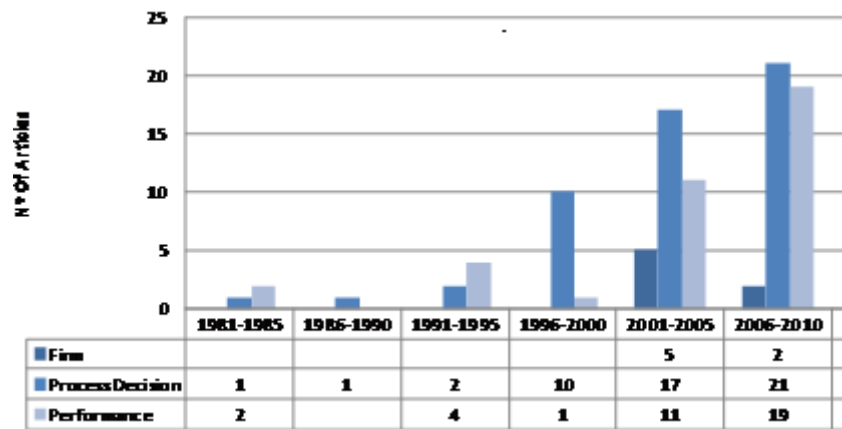
More recently, Cleyn and Braet (2006) proposed an integrated model. To begin with, the starting and end point are dynamic, this means that they can happen either in a more advanced stage or earlier in the process. Furthermore, the stages are considered independent unlike the previous model (Ndonzuau *et al.* (2002; Hindle *et al.*, 2004). According to the model, an idea that has originated a company only ends when its entity disappears. Also, the model predicts that different paths could occur in the process through buy-outs like mergers or buy-ins like acquisitions, changing the original company. The model concedes the markets role and the impact of the business plan in the spin-off process. Ultimately, the model foresees the interactions between the different phases, and also between the different identities involved in the process, combining the all kinds of information and capabilities, providing a more realist approach of the reality.

Based on the above proposals, we devised a simpler model that seeks to explain the spin-off's emergence process, by highlighting three distinct, although interrelated, phases (Figure 2): 1) the firm and all that surrounds and influences it ('Firms'); 2) the decision process with all its variable inputs that can lead to a Spin-Off ('Decision process'); and 3) the outcome results of a spin-off firm ('Performance').



**Figure 2: The process of Spin-Off creation**

Figure 3 presents the distribution of the literature according the model proposed. The spin-off decision process has been the most analyzed subject of research. However, in the more recent periods the assessment of the performance impact has gain prominence.



**Figure 3: The distribution of the literature on 1981-2012 according the model proposed**

*Source:* Author's computations based on papers gathered from Scopus®

### 1.3. Detailing the phases of the process of corporate spin off creation

#### 1.3.1. 'Firms'

There are several factors related with the capacity of an organization to generate value through the process of a spin-off creation. The consensus that company's entrepreneurial characteristics are one of the key elements to develop and create value inside an organization is undeniable (Antoncic and Hisrich, 2001). The strategies behind entrepreneurship are of high importance, as they increase the perspective of value-creation and value appropriation (Agarwall *et al.*, 2004).

The importance of the characteristics that differentiate companies, such as risk-taking orientation, are critical. These allow attempts for quests that search for bold visions (Zahra, 1996). Entrepreneurship, as well as the capacity to develop and create values, is deeply connected with knowledge and an existent competence within the organization. However, this depends not only on the employees' education but also on the path conducted by the company's exposure to unique experiences, such as geographical environment, the interaction among customers and suppliers, alliances with other forms or even market competitors (Zahra and George, 2002).

Companies use their human capital to develop and create value offers, where simultaneously, employees earn more technological know-how, new social links, and cultural enrichment from the employers (Zahra, 1996; Zahra and George, 2002). Zahra



and George (2002) suggest that the tacit knowledge existent inside an organization is also inherently present in individual employees. Further, according to the same authors, “employees of firms with greater knowledge capabilities are more likely to perceive the next generation of technologies and markets earlier than their counterparts in firms that lag behind.” (Agarwall *et al.*, 2004: 6).

In fact, employees with higher skills benefit companies through: 1) the capacity to create value, 2) the improvement of their adapting and learning skills, and 3) the identification of new opportunities (Agarwall *et al.*, 2004), giving them the capacity to increase the business performance or diversifying the product’s portfolio. Agarwall *et al.* (2004) argue that these skills are especially important in high technology markets, where technology volatility is very high and frequent and in some cases disruptive, creating opportunities and big threats.

This know-how and knowledge crucially came with the assumption that technology innovation is what drives companies to success (Zahra, 1996). The literature agrees on this associating company’s performance to its technological competence and innovation. The technological competence is what allows a company to generate new discoveries and breakthroughs, enabling the company to commercialize the innovation in the foreheads of competitors, gaining an important advantage (Zahra, 1996; Chesbrough, 2003; Agarwall *et al.*; 2004; Klepper and Sleeper, 2005; Narayanan et al., 2009).

The corporation management should be able to monitor and use all sources of technology, whether they are internal or external. These could improve the company performance, through the incorporation of these advances and innovations in the products or process. However, it is critical to identify correctly the conditions needed to take advantage from them, which in some cases can be very hard. These conditions can go from the employees’ education, hiring and, in some cases, even acquiring a company to obtain the right skills (Zahra, 1996).

The use of external sources of technology is more than a trend. The existence of the denominated technology market, where companies can profit from their in-house R&D through new types of business models like licensing or selling the intellectual proprietary existent in the technology, cannot be neglected by top management (Zahra, 1996; Arora *et al.*, 2001; Agarwall *et al.*, 2004). This is so crucial, that companies tend to invest in monitoring technological developments trying to identify possible threats

and opportunities. Nowadays, technology forecasting is without doubt a critical dimension for companies' technology strategies. This gives the corporation management a timeline of information about environmental changes (Zahra, 1996). Zahra (1996) referred a survey from Fortune 500,<sup>2</sup> where technological environment is the second most frequent scanned sector.

The use of external technology can be an important driver of innovation. Agarwall *et al.* (2004) stress the complementary nature of technology and the synergies that can be obtained from these external sources.

According to Nelson (1991: 64), "[t]he overall result is a view that what firms do is determined by the conditions they face, and (possibility) by certain unique attributes (say a choice location, or a proprietary technology) they process. Firms facing different markets will behave differently, but if the market conditions were reversed so would be firm behaviors". Inevitably, this will lead to different strategies, and consequently, different cultures, processes, capabilities, unique paths and therefore, creating a unique identity.

Nevertheless, a company's identity is not a monolithic phenomenon. Multiple identities can exist and co-exist comfortably within a company even if they are slightly different. Moreover, corporate leadership should recognize incongruence among them in order to prevent causing problems between the company and its stakeholders (Balmer and Greyser, 2002).

According to Corley and Gioia (2004) and Corley (2004), an organization's identity is normally defined answering the question 'Who are we as an organization?'. This represents perceptions and beliefs on what distinguishes the organization from other companies, and given the fact that an organization is composed by a large group of people, its potential for identity differentiation is very high (Corley, 2004). In addition, such identity is built around the relationship between all resources at the company's disposal, namely, among others, assets, technological knowledge, human resources, organizational processes and network linkages (Lindholm Dahlstrand, 1997).

The literature underlines the role of networks as a key resource of a company (Zahra, 1996), not only by enabling its access to resources and competences, but also by

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<sup>2</sup> The Fortune 500 is an annual list compiled and published by Fortune magazine that ranks the top 500 U.S. closely held and public corporations as ranked by their gross revenue after adjustments made by Fortune. (<http://money.cnn.com/magazines/fortune/>, accessed 25 January of 2012).

allowing the sharing of intangible assets, such as the market perception, its visions, its problems, that are critical in the innovation process (Lindelöf and Löfsten, 2005). Network is a critical element on the uniqueness of an organization's identity as it is path dependent and, therefore, according to Lindelöf and Löfsten (2005: 1028), "idiosyncratic and difficult to imitate and is a subject of immobility, inimitability and non substitutional".

However, as the organizational identity is socially created and a self-referential belief shared by organization members, it is bound to be influenced and changed, especially from powerful external stakeholders and competitive pressures perceived by the top management (Corley, 2004). The process of an identity change is normally very slow and incremental that can last over years (Corley and Gioia, 2004). Nevertheless, there are some cases where changes in organizational identity are so overwhelming and discontinuous that they are difficult to explain (Corley and Gioia, 2004).

The Spin-Off creation is an occurrence that potentiates organizational identity changes. This new organization that seeks its own survival, growth and success, might have its own vision, perceptions and beliefs (Nelson 1991; Zahra, 1996; Agarwall *et al.*, 2004; Corley, 2004). Although the introduced changes are normally quite rapid, they can be associated with uncertainties and unpredictable, and so, in this way, it becomes a process filled with ambiguity (Corley and Gioia, 2004). During this process, and given that the comprehension of the ambiguity has crucial dimension to the spin-off process, organizational leaders should undertake sense giving promoting collective sense making, in order to cultivate a renewed clarity about the amended identity (Zahra *et al.*, 1999; Corley and Gioia, 2004).

One of most important facts that foster organizational identity changes is innovation (Corley and Gioia, 2004). Despite the acknowledgement that the major competitive advantages come from radical innovations, the truth is that large incumbent companies tend to defend their position with incremental innovations (Rohrbeck *et al.*, 2009), by adopting more conservative, risk adverse and reactive strategies (Lindelöf and Löfsten, 2006). Smaller companies which are more focused and agile, on one hand struggle to find a competitive edge over incumbents, and on another hand rely on radical innovations to get that extra mile run, favoring differentiation strategies, and thus being more risk takers and proactive (Lindelöf and Löfsten, 2006, 2005).

The importance of innovation in a crowd and competitive market, defined by technological convergence, has pressured large companies to invest in a strong R&D division (Rohrbeck *et al.*, 2009). The R&D outcomes are normally transferred to the company through the development of the existing products, where the market units receive the evolution very positively (Rohrbeck *et al.*, 2009). However, when the results are radical innovations, large companies have difficulties in handling them and taking advantage of the opportunity. This is related to the fact that organizations do not normally have the right skills to handle new discoveries. The lack of skills can be caused by the company's unawareness of the market that endorses this type of technology, or by employees' inaptitude to quickly learn the right skills (Rohrbeck *et al.*, 2009).

We cannot fail to mention that the R&D investment is deeply affected by the environment where the company acts. For instance, in highly competitive markets, companies tend to invest in process innovation or in incremental technology. This is made in an attempt to increase the competitive position and profit returns (Antoncic and Hisrich, 2001). Further, in technology markets, where the effects of appropriability are very high and innovation output is difficult, one tends to observe increases in the demand of R&D. But, on the other hand, lower appropriability decreases the research cost by increasing the opportunities of others to use it (Antoncic and Hisrich, 2001).

These influences and risks, associated with the intellectual propriety rights, have increased strategic alliances, such as joint ventures, license deals, spin-offs, corporate capital. Also, when taking advantage of the R&D knowledge either by signaling the importance of the intangible technology value in the market or by positioning these alliances, it gives companies a sustainable and competitive advantage that competitors cannot access (Arora *et al.*, 2001). Further, Arora *et al.* (2001), argue that these dynamics give large companies opportunities to profit from in-house technology that is not used. Moreover, it also gives small companies, like spin-offs, the opportunity to engage in the more focus strategies based on technology development, pursuing the commercialization of them more efficiently.

The use of innovation discovery in large companies tends to be slow, because of the risk of employees leaving the firm with the new discovery and exploring it commercially on their own (Agarwall *et al.*, 2004). When this happens companies tend to lose all the possible value that they could have profited from. Chesbrough (2002) exemplifies this,

referring to the Xerox case. After creating PARK – Palo Alto Research Center, in 1970, the company's employees started to leave the company in order to explore commercially some of the technologies discovered: “[b]y 1998, thirty-five new companies had been created” (Chesbrough, 2002: 810).

Another risk that radical innovations have is their ‘window of opportunity’. Innovation consists on creating solutions for existing problems (Lindelöf and Löfsten, 2006). However, for an innovation to be perceived by the market, the market has to be prepared to receive it. This should be taken into account by the corporation management when acknowledged, as they are one of most precious, but intangible, assets of a company. According to Rohrbeck *et al.* (2009), the past is full of examples where successfully commercialized inventions were not made by the inventive company but by a competitor that copied the product.

The potential of technology discoveries is very hard to measure. However, the literature points out the need of an association between the discovery and a right business model, which could unlock the market gates, reaching the customer's needs and pushing the company to success (Chesbrough and Rosenbloom, 2002; Agarwall *et al.*, 2004).

### **1.3.2. ‘Decision Process’**

According to Lindholm Dahlstrand (1997), there are different reasons to believe that corporate *spin-offs* can create value: 1) it offers a different degree of management, lighter and more flexible, suitable for new challenges; and 2) it empowers it to exploit new ideas or new technology outside the company's interests and pressures.

The spin-off creation is a corporate instrument which large companies may carry out in order to pursuit and develop new areas outside their direct range, and where potential future interests and economic profits are high (Antoncic and Hisrich, 2001; Chesbrough, 2002; Chesbrough and Rosenbloom, 2002; Klepper and Sleeper, 2005). However, the decision process of spinning a new company is associated with the parent companies' ability in taking initiative and taking risks. It is considered a bold and disruptive instrument used to pursuit new opportunities, such as, new business areas, new products or services (Antoncic and Hisrich, 2001; Chesbrough, 2002; Chesbrough and Rosenbloom, 2002).

The technology spin-off opportunity emerges in the presence of a discovery where the prospect of commercial potential is high (Clarysse *et al.*, 2005), but not belonging to the

main core business, the company do not know how to take advantage from them, converting it in value offers perceived by the market (Zahra, 1996; Chesbrough, 2003; Agarwall *et al.*, 2004; Narayanan *et al.*, 2009).

The value of technology and the appropriability is another important factor that corporation management evaluates, normally associated with the technology properties of the discovery (Clarysse *et al.*, 2011). According to Clarysse *et al.* (2011: 1420), the technology properties can be characterized by “the fundamentals of the knowledge characteristics underlying the technological regime, including the complexity, the tacitness, and the level of pervasiveness or scope of the technological knowledge base”. This technology assessment is normally associated with an intellectual property evaluation and the “state of the art”. Depending on the technology market, it is critical to measure the intellectual proprietary that could exist on a discovery. For accomplish this companies must analyze the patents filled in the respective regions throughout the patents offices existent and, in the presence of novelty use all instruments at reach, protecting their intellectual proprietary rights, through the submission of one or more patens (Clarysse *et al.*, 2005).

In face of a new technological discovery the corporation management has several instruments at disposition in order to convert the invention in innovation. This transformation gives to the markets new value offers, increasing the economic and social benefits (Zahra, 1996; Chesbrough and Rosenbloom, 2002; Chesbrough, 2003; Clarysse *et al.*, 2005; Rohrbeck *et al.*, 2009). The decision taken are based on perceptions of different kind of dimensions, like: 1) the market value evaluation, 2) the extent of novelty emerged, 3) the degree of appropriability, 4) the amount of expertise required to handle the opportunity, 5) the skills existent in the company, and 6) the market trends and expectations (Clarysse *et al.*, 2005; Chesbrough and Rosenbloom, 2002). These different dimensions lead the company to choose what to do with the technology. The decision can be divided into two different managerial approaches. The first includes to maintain the discovery in house throughout options that can go from (Zahra, 1996; Chesbrough and Rosenbloom, 2002; Chesbrough, 2003; Clarysse *et al.*, 2005; Rohrbeck *et al.*, 2009; Narayanan *et al.*, 2009): 1) doing nothing putting the technology in “shelf” to use later on, 2) passing through the possibility of including the discovery in the current core business contributing to a incremental product innovation, 3) to the creation of a new product/service increasing the diversity, and 4) for seeking to

sale or license the technology to other firms and in this way guaranteeing some profit. The second option is to use a corporate venturing mechanism, which can pass through a company spin-off or a joint-venture with other firm, externalizing the development and commercialization of the discovery (Antoncic and Hisrich, 2001; Chesbrough and Rosenbloom, 2002; Chesbrough, 2003; Klepper and Sleeper, 2005; Clarysse *et al.*, 2005; Rohrbeck *et al.*, 2009).

Chesbrough and Rosenbloom (2002) highlight the importance of making a business plan so that the commercial potential of the technology could be evaluated. The authors argue that only the right business model can unleash the value existent in technology, and even then it could remain uncertain until the commercialization stage. However, corporation management should be aware that successful business models might not fit the circumstances of technology or a market opportunity (Chesbrough and Rosenbloom, 2002). Many technology entrepreneurs have protected their position and extraordinary returns by integrating their innovations in an existing value chain (Gans and Stern, 2003). In the literature we can find several worldwide companies (e.g. 3Com, Adobe, Sun, Intel) that started by using this strategy and opening their way to success (Chesbrough and Rosenbloom, 2002; Gans and Stern, 2003).

In the decision process one of the crucial factors that encourage the spin-off process is the positive link relations that will exist between the two companies. These relations will promote synergies and knowledge transfers. Allowing the corporation to stay focused, or in some cases makes a refocus on the commercialization of its core business, controlling more easily complementarities that can be created (Gans and Stern, 2003).

In addition, for companies that have implemented processes to explore technology, both in products or markets, corporate *spin-offs* offer a mean of acquirement skills that facilitate the understanding and knowledge of new markets, through the entering of a specific product, getting gradually a steady position and tacit market knowledge (Gans and Stern, 2003).

Another factor that weights in the spin-off decision is the market pressure to which the company is exposed. Costumers demand better, cheaper and more advanced products. Additionally, the technology uncertainty is very high. These factors combined create substantial threats to the incumbent companies, being even more critical in the

technology markets. Companies react to these risks by forecasting technology innovation, costumer trends and demands (Zahra, 1996).

Another important factor, pointed out by some authors such as Rohrbeck *et al.* (2009), Chesbrough and Rosenbloom (2002), or Zahra (1996), is the company's technology strategy or market position. The latter author argues that in technology markets "[c]ompanies often use pioneering offensively to capture premium segments, achieve economies of scale, set industry standards, or control distribution channels" (Zahra, 1996: 193), more often. Furthermore, Zahra *et al.* (1999), following the Porter framework, suggest that a corporation can be compelled to spin-off companies, creating a competitive advantage by creating barriers to competitors' entrance. We cannot forget to point out that, according to the Zahra *et al.* (1999), the hostility in these kind of markets have a negative impact in the market's growth in a long run, decreasing the R&D expenses, and diminishing spin-off's dynamics. The authors suggested that because of this in the last few years the R&D investment has declined in the USA.

In the decision of setting up a spin-off a company's corporation management takes into consideration the fact that, associated to the new, light and fresh company there is a positive pressure of taking technology quickly into the market, and therefore, achieve success (Klepper and Sleeper, 2005; Zahra *et al.*, 2007). According to Zahra *et al.* (2007), "focusing on a few specific product applications, corporate *spin-offs* can quickly address customers' needs, thereby contributing to the corporate spin-off's growth". However, Nelson (1991) argued in the path of the spin-off it should pass through increase the scope of the technology, diversifying market applications, and in this way minimizing risks and amortizing the costs. Therefore, the management of the company's product portfolio is critical, meaning that having a large number of products is not always conducive to performance and profit (Zahra, 1996).

Possessing potential technologies corporations undertake the process of funding these operations (Clarysse *et al.*, 2005). According to Clarysse *et al.* (2005), this process put into practice can be very complex. The success of the spin-off is directly associated with the star-up resources (Davila *et al.*, 2003). Davila *et al.* (2003) argues that the spin-off funding event provides a credible and strong signal to the market. The market perception can be explained by (Davila *et al.*, 2003): 1) venture capital capacity to invest in potential projects, 2) venture capitalist participation in the board and the active role that they will have in the spin-off governance perspective, 3) venture capitalist



bring a network of contacts and influence brought by venture capitalist, 4) venture capitalist bring reputation effect that facilitates the growth brought by venture capitalist. The market reaction tends to be a reflection of a company's potential and for this reason Sullivan and Marvel's (2011) research suggests that market knowledge is a critical factor allowing companies to refine and adjust their products or services to the market needs or demands.

The localization of a spin-off is a determinant factor for the success of the new company (Zucker and Darby, 1998). We cannot oversight the externalities that the company will get by being near of what really matters to it. Zucker and Darby (1998) argue that in case of science based industries the links and relations among scientists are a key element. In other words, because the replications are not widely known prior to the discovery, any scientist wishing to build on the new knowledge has to first acquire hands-on experience. This tacit relation is critical for the course of technology innovation as well as in the complementarily that could be gained. The Silicon Valley is proof that these tacit relations, experience share, are determinant to a company's success.

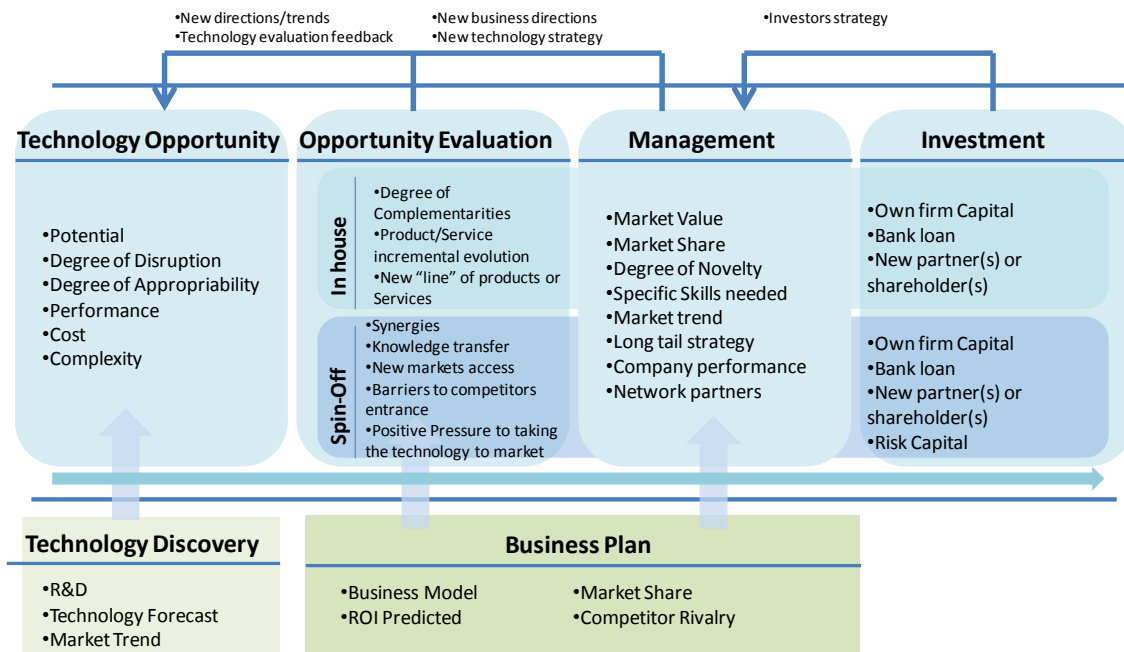
Another important key element in the spin-off process and its success is the human capital that will be at disposal. According to Clarysse *et al.*, (2005), there are six types of resources critical for the spin-off: human, social, financial, physical, technology, and organizational. The human and social factors are major success keys, mainly in the technology spin-off. Here the know-how and the innovative and entrepreneurship skills will be determinant in the new company's life and success. The spin-off should contain highly educated, ambitious and motivated employees' (Davenport *et al.*, 2002). These factors must be taken into account at the time of the creation of the spin-off by the parent company.

The final phase of the spin-off's creation process is the definition of the stakeholder structure. Even in this phase of creation it is critical to identify capabilities gaps, so they can be leaded in a renewed strategy. Many common strategies are alliances or hiring specific human resources and filling the existent gaps converting threats in opportunities. The knowledge of agents involved in the product creation, since it conveys the approach and linkage creation between key agents, increasing the competitiveness of the value chain (Davenport *et al.*, 2002).

Corporation management cannot forget that the new company will be deeply connected to its origin with Zahra *et al.* (2007) arguing that knowledge and experiences that a company has at its birth will be determinant when explaining the course that it will take. The authors argue that it is reasonable to assume that spin-offs' capabilities are linked to an inherited knowledge.

Finally, it is important to mention the insight that has led to the creation of a spin-off. Several authors argue that conceptualization and visioning of the technology capabilities motivates us to achieve what has been foreseen (Chesbrough and Rosenbloom, 2002; Clarysse *et al.*, 2005; Zahra *et al.*, 2007). Furthermore, the sharing of this knowledge and vision about technology, industry, or market, leads to findings of multiple uses for their assets, helping on the identification of potential customers and new opportunities. According to Zahra *et al.* (2007: 577), "the better the spin-offs' conceptualization and visioning capability, the higher their chances of finding commercial uses for their products and achieving high performance."

Based on the different steps involved in the decision process of a spin-off creation mention previously, we create a model that aims to explain the technology spin-off's decision process. It is highlighted four distinct, although not completely independent, phases (Figure 4): 1) the technology that have emerged, with all that surrounds and influences it, from the R&D to the technology market trends ('Technology Opportunity'); 2) the evaluation that is performed with all options available to management to take the opportunity, we underline as mention previously the importance of this phase be followed by the creation of the right business plan (Chesbrough and Rosenbloom, 2002) ('Opportunity Evaluation'); 3) top management decision, evaluating not only the opportunity but several other different dimensions (eg. Market Value, Market share, the degree of novelty, skills and competences needed, the costumer and market trend, the long tail company's strategy, the network partners available to leveraged the opportunity, and the competitors rivalry) that can lead the decision to success ('Management'); and 4) in the need of investment, it is evaluated all the possibilities, and in this step may even change the decision made ('Investment').



**Figure 4: The decision process of a Spin-Off's creation**

Recall that the four distinct phases are not completely independent. The model provides the possibility in each step to give a feedback to the previous phase, aligning the technology that could be discovered with the direction/strategy pressure by management or giving inputs for refining the discovery to meet the market needs.

### 1.3.3. 'Performance'

From an economic perspective there are two main benefits that might be achieved from the creation of a spin off (Zahra, 1996; Chesbrough and Rosenbloom, 2002; Chesbrough, 2003; Agarwall *et al.*, 2004; Klepper and Sleeper, 2005; Narayanan *et al.*, 2009): 1) increase the returns to shareholders by the use of the technological discovery, 2) its growth, presenting positive economic returns, obtained from the refocus strategy followed.

The impact of a new company on the market will be deeply connected to the market's perception of the potential that it possesses at the time of its entry. Among others, potential customers, distribution channels, the company's position in the value chain, its partners influence the referred to perception. They also reflect on the market's level of adherence (Sullivan and Marvel, 2011).

In fact, according with Daley *et al.* (1997), only the cross-industry *spin-offs* are associated with positive and significant economic returns around announcements. The

authors argue that this evidence is consistent with the results from asset sale studies. However, the spin-off operation allows managers the freedom to deal with unrelated activities from the core business of the parent company, as to consequently improve the corporation performance (John and Ofek, 1995; Daley *et al.*, 1997). John and Ofek (1995) and Daley *et al* (1997) refer to this as the ‘Corporate Focus Hypothesis’. The authors argue that when focusing in the core business and in the elimination of negative synergies that exist between the divested and the remaining, the performance will increase. In addition, performance increase may occur due to alignments between managers and shareholders. The spin-off process allows companies, both parent and the new born, to review existing contracts in the chain value as well as existing objectives and contracts with managers, and also, to improve the performance as a whole (Daley *et al.*, 1997).

The belief that a spin-off will improve value to the economy is aligned with the positive effects surrounding the spin-off’s announcement (Schipper and Smith, 1983; Cusatis *et al.*, 1993; Chemmanur and Yan, 2004; Rovetta, 2006; Harris and Glegg, 2008). These spin-off announcements not only have positive effects in the companies involved, but also bring positive returns for the competition (Harris and Glegg, 2008). The price’s response to announcements is higher when the operations take place in markets where takeovers are more active and frequent; this happens because there is a possibility that the spun-off company will become a target for an acquisition (Harris and Glegg, 2008). According to Schipper and Smith (1983), evidence shows that these transactions have positive stock returns at around 3%, on the average.

Further, the price’s reaction tends to be sensitive to countries’ legislation, being higher in those with a better legal protection over outside shareholders. Harris and Glegg (2008: 462), suggest that “cross-border *spin-offs* that lead to adverse changes in investor protection are associated with lower wealth effects”. According to Schipper and Smith (1983: 437), “[t]he gains to shareholders may arise from relaxed regulatory and tax constraints and improved managerial efficiency”.

The positive price reaction around announcements dates reflects investors’ expectations about the value creation potential, unleashed to the markets with the spin-off. There is the outlook that the spin-off parent company will increase the performance as the decision taken is clear signal to markets of the strategy being followed (Cusatis *et al.*, 1993; John and Ofek, 1995; Chemmanur and Yan, 2004). Further, these abnormal

returns are also associated with the corporation restructuration, and the expectation that it will be more agile and competitive (Cusatis *et al.*, 1993).

There is evidence that *spin-offs* experience more takeovers, when investors failed to anticipate the value creation brought by the spin-off (Cusatis *et al.*, 1993; Chemmanur and Yan, 2004). According to Chemmanur and Yan (2004), the increase of these takeovers happens for the right reason: the pursuit of value improvement by top management.

From the market's point of view, the *spin-offs* process, which divides a company into separate businesses, provides bidders the opportunity to create value by giving them a relatively low cost channel to transfer control from corporate asset to acquiring firms (Cusatis *et al.*, 1993; Harris and Glegg, 2008).

According to Rovetta (2006), positive reactions verified by markets, due to a spin off process, reflect a perception of improvement in capital allocations. New companies tend to put their faith and strengths in segments with high growth opportunities and potential.

A spin-off creation changes the environmental background of companies. The spin-off process increases the information that breaks out to the market and so, it increases the knowledge on the companies in order to observe closely and inform traders (Huson and Mackinnon, 2003). These reduce inter-shareholder information asymmetry allows a more detailed evaluation of the company. The days following the announcements the trade's transactions increase deeply, and informed traders with a superior knowledge take advantage and profit from the least informed (Huson and Mackinnon, 2003).

The literature indentifies several factors that can explain the market's behaviour, as mentioned above, such as: 1) tax and regulatory benefits (Schipper and Smith, 1983); 2) low cost transfer channels between companies (Cusatis *et al.*, 1993; Harris and Glegg, 2008); 3) increased corporate focus (John and Ofek, 1995; Daley *et al.*, 1997); 4) increase the efficient contracting in the chain value (Schipper and Smith, 1983); 5) less information asymmetry (Huson and Mackinnon, 2003); and 6) improvements in capital allocation as a new potential explanation for gains from corporate *spin-offs* (Rovetta, 2006).

It is important to mention the links existent between the parent company and the spun-off company. These relations can deeply influence the behaviour and performance of both companies. Although some linkages are beneficial, if there are too many it is/can

be negatively received by the market (Semandeni and Cannella, 2011). Taking into consideration that a substantial ownership by the parent company can be harmful, after awhile the spun-off company could stop competing with the parent and, therefore, bring additional risks to the parent as incumbent (Semandeni and Cannella, 2011). Moreover, with a spin-off, a company loses the benefits in diversifying through operating in a different line of business. The company may lose the opportunity to raise its returns through (Berger and Ofek, 1995): 1) the enhancement in operation and administration efficiency, 2) the commercialization of different products, 3) the synergies existent in the products value chain, 3) the strengthen of the debt capacity, and 4) lower taxes. In this way, managers may be tempted to want their firms to engage in diversification, as it is a way of reducing the risks about their future compensation, and of increasing their power and prestige (Martin and Sayrak, 2003).

The literature about corporation diversification and the creation of firm value is large and diversified (Martin and Sayrak, 2003). However, according to Martin and Sayrak (2003: 38), the scientific debate continues present and without a clear answer to the following question: “Does corporate diversification create or destroy shareholder value?”.

In following chapter it is detailed the methodological considerations, aiming the answer of central question of the present dissertation: ‘Are technology *spin-offs* effective corporate performance instruments? ’.

## **Chapter 2. Methodological underpinnings**

### **2.1. Initial considerations**

The present dissertation aims the answering of the following question: ‘Are technology *spin-offs* effective corporate performance instruments?’. In particular, we seek to assess the determinants that impel the creation of a technology spin-off, and the factors behind the success/failure of technology spin-off in terms of value generation. Summing up, our aim is to study the process of emergence of corporate technological spin-offs, to analyze them as corporate/management performance instruments, and to assess their economic and financial impact at the level of the host company. The next section (Section 2.2.) details the framework for analyzing the selected case studies and then, in Section 2.3., we justify the selection of some PSI corporations as units of analysis.

### **2.2. Framework of analysis**

Within the theoretical discussion on the emergence of technological *spin-offs* as corporate performance instrument (Chapter 1), two types of approaches were identified: one, more managerial focused, and the other, more economic based linked to the assessment of the financial and social benefits that can be externalized. Moreover, from the literature review, we conclude that two types of scientific research approaches are followed, the quantitative and the qualitative approaches. In a research the quantitative looks from general and advanced cases to a more specific one, being considered a deductive approach. The quantitative seeks generalization - through the analyses of the collected data, the researcher seeks patterns and evidence that can lead to answer the question under investigation at a general level.

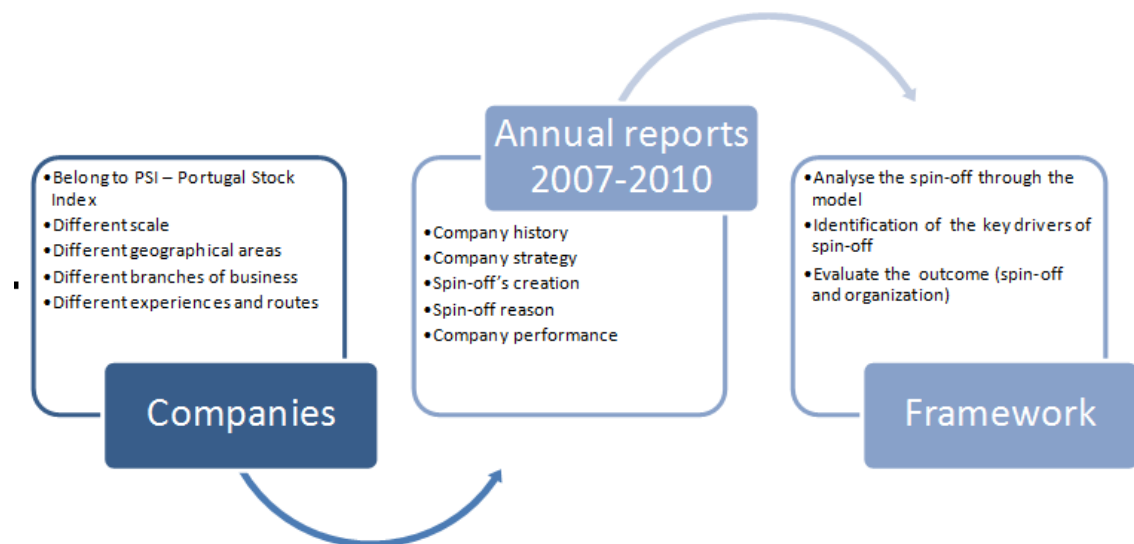
Most of the articles that analyze managerial problems, as well as the relationship between the factors that condition the firm’s behaviour and performance, tend to adopt a more conceptual and theoretical stance than those that are economic based. The former approach is typically more centered in the company and its relationships pursuing a more qualitative methodology. Authors like Rohrbeck *et al.* (2009), when analysing the Dutch Telecom company, Corley (2004) and Corley and Gioia (2004), who made several interviews to a set of companies, or Chesbrough (2003, 2002) with the research on the Xerox Corporation, are representative of this line of research at the empirical level. At a conceptual level, several studies such as Cleyn and Braet (2010), Gans and

Stern (2003), Davenport et al. (2002), or Zahra and George (2002), conducted a theoretical reflections on the theme, making an overview of the literature or debating the theme in question.

Articles focusing on researching and assessing the economic and financial impacts, tend to be empirical and quantitative, presenting evidence on the hypotheses rose. These articles lean on the measuring of performance impacts, gathering the underlying data from international and financial databases, such as Capital IQ (John and Ofek, 1995; Martin and Sayrak, 2003), NYSE Euronext (John and Ofek, 1995), CRSP (Rovetta 2006), Thomson Reuters (Harris and Glegg, 2008), Standard & Poor's (Martin and Sayrak, 2003), Moody's (Cusatis *et al.*, 1993; Rovetta 2006).

Being the theme of the present dissertation the technological spin-off's emergence process, the determinants of the decision to create the spin off, and to assess to what extent the spin off contributed to the economic and financial performance of the host company, it is our intention to follow a qualitative approach, based on a content analysis. The content analysis allows the researcher to test theoretical issues enhancing the understanding of the data, and helping to get answer to the researcher questions.

In Figure 5 it is summarized the process analyzes that was used to conduct our investigation and research.



**Figure 5: Qualitative process analyses**

Source: Author

Our qualitative research analyses are based on the investigation of several relevant Portuguese companies which belong to the Portuguese Stock Index (PSI).



Given our theoretical framework, and based on publically available companies' annual reports, from 2007 to 2010, the investigation includes the evaluation of each company in different dimensions namely, its historical past, long run strategy, financial performance, and spin-offs created. The goal of this content analyses is to identify the main key drivers of companies' decision to create spin offs and the outcome that was generate by firms of using spin-offs as a management instrument.

### **2.3. Reasoning for selecting PSI corporations as unit of analysis**

The option for companies indexed in PSI has to do with the possibility of accessing freely to the relevant and needed information (these firms are legally binding to disclosure financial and information on mergers, acquisitions and starting of new companies).

Moreover, the PSI group comprise firms that area quite distinct in terms of business scope, size and strategies, enabling to study the process of spin off creation involving complementary dimensions: 1) different scale; 2) different geographical areas; 3) different branches of business; 4) with different (strategic) experiences and routes.

With these dimensions in mind, we decided to analyze 4 companies (out of the 20 that are included in PSI): Martifer, SA; EDP-Energias de Portugal, SA; Galp-Energia, SA; and Sonae-SGPS.

## **Chapter 3. Technology spin-off as corporate performance instruments. Results from the qualitative analyses on the some PSI corporations**

### **3.1. Initial considerations**

In order to perform our qualitative research it was conducted an investigation on several relevant companies from the Portuguese enterprise tissue belonging to the PSI (Portuguese Stock Index), with distinct characteristics, and belonging to different economic sectors. The investigation encompasses the evaluation of the company's strategy, financial performance and spin off decision process, through the content analyses of its annual reports from 2007 to 2010. The selected companies are: Martifer, EDP-Energias de Portugal, Galp-Energia, and Sonae-SGPS.

Being the goal of our study to assess the determinants that impel the creation of a technology spin-off by the selected companies, specifically identifying the factors behind the success/failure of technology spin-off in terms of value generation, given that global macroeconomic performance of the country can constraint companies' economic performance, in the chapter we decided to start (Section 3.2.) by providing a brief account of the macroeconomic context of the world economy over the period in study (2007 to 2010). In the following section (Section 3.3.) we present the content analysis for each company. We close the chapter (Section 3.3.) with a synthesis of the results wrapped into our theoretical frame.

### **3.2. A brief account of the world macroeconomic context over the period 2007-2010<sup>3</sup>**

In 2007 the global Gross Domestic Product (GDP) measured in purchasing power parity exchange rates increased by 4.9%, which represented a deceleration from 2006 (0.1% lower growth rate recorded in 2006).

The economic activity decelerated in the advanced economies, particularly in the United States, where the crisis in the subprime mortgage market affected a broad range of financial markets and institutions. However, the strong overall economic performance

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<sup>3</sup> This macroeconomic analysis was made based on the International Monetary Fund reports, namely that of 2010 (IMF, 2010).

continued to reflect, to a large extent, the economic growth in the emerging countries (7.7%). China, Russia and India accounted for half of global economic growth.

In the first half of 2007, the European Central Bank (ECB) adopted a tighter monetary policy (with the reference interest rate increased by 50 basis points by July, to 4%), in order to control inflationary pressures resulting from the positive economic performance and due the rise of the price of petroleum. From July of 2007, the ECB has caught the upward trend in the reference interest rate, in response to the liquidity problem in financial markets resulting from the crisis observed in the U.S. sub-prime crisis and consequent financial confidence. Through this policy, the ECB kept rate disinflation the target of 2.0% for the Eurozone. In the EU, inflation reached 2.3%.

In 2008, and according to IMF, the world economy registered a growth rate of 3.4%, decelerating 2.8% over 2007. The deepening financial crisis from autumn was on slowdown. Despite having slowed from 8.3% in 2007 to 6.3% in 2008, the growth in the emerging countries continued to contribute significantly to global growth. Advanced economies were responsible for the slowdown, slowing from growth of 2.7% in 2007 to 1.0% in 2008.

The rapid economic downturn was the most unusual feature of 2008, created by the sub-prime crisis. The impact of the financial crisis on the real economy became more pronounced from the fall, and the Eurozone entered its first technical recession at the end of 2008. Both the European Union and ZE have slowed relative to 2007 performance 1.0% in 2008 (2.9% in 2007) and ZE 0.9% (2.7 in 2007), mainly due to the slowdown in investment and private consumption.

According to IMF in 2009, in the IMF (Annual Report 2010 Supporting a Balanced Global Recovery, 2010: 9), the “[p]olicymakers responded to the crisis by implementing a set of bold and aggressive monetary, fiscal, and financial sector policy measures that were delivered in an environment of unprecedented cooperation. These concerted policy actions were successful in arresting and then reversing the downward economic spiral. Financial market conditions improved, and the first signs of an emerging recovery became evident in the second half of 2009, with growth gaining steam in early 2010. Nevertheless, the recovery remained moderate and uneven, with advanced country growth relatively weak, but emerging markets and low-income countries generally rebounding strongly.”

Despite de intervention performed by the major economic institutions (FED, ECB, BE, among others) the year 2009 was characterized by a strong deceleration of activity in major economic areas. This development was mainly driven by a significant deterioration in economic confidence, leading to a fall in demand and the collapse of international trade flows in the first half of the year. The recession was a scenario of lower availability of liquidity in financial markets and, as a result, an environment of tightening of financing economic activity. Authorities responded by reducing the benchmark interest below 1%, the massive injection of liquidity into the financial system and at the level of fiscal policy through tax incentives the consumption of durable goods and an increase in public investment in infrastructure. The aggressiveness of these stimuli was observed in the second half of the year, and especially in the fourth quarter signs of accelerating economic activity and financial stabilization.

In 2010, and according to IMF, the global economy recovered, although growth remained uneven across countries. In many advanced countries, growth continued to be relatively weak, held back by high unemployment rates, weak financial conditions, and concerns about the fiscal and financial sector outlook. Difficulties in a number of European countries have been particularly acute, and among those with problems was Portugal, with strong problems with public debt. In contrast, growth in emerging markets was strong but with inflation rising and growing concerns about overheating in a number of these economies.

### **3.3. Martifer**

#### **3.3.1. Brief description of the company**

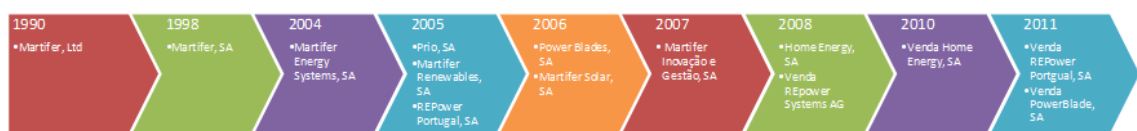
The company was created in February of 1990 as a private limited company with a social capital of 22.500€ and headquarters in the Industrial Zone of Oliveira de Frades (Viseu, Centre of Portugal), this headquarters has been maintained until today. In 26 of May of 1998 the company is transformed into a corporation, changing its shareholder structure. The social capital started to be shared by the I'M – SGPS (Carlos Manuel Marques Martins, Jorge Alberto Marques Martins, and other shareholders), SA and FM – *Sociedade de Controlo*, SGPS, SA (Mota-Engil – SGPS, SA, and other shareholders).

From the start the Martifer's core business has been the metallurgical constructions. The shareholder structure, included large building companies, has leveraged Martifer's

business since during this period many consortiums have been created between them permitting Martifer to earn large international/national projects.

### 3.3.2. Corportate spin offs decision process

In 2004, Martifer starts the activity in the sector of renewable energy equipments through the creation of the Martifer Energy Systems (see Figure 5). Initially this company was dedicated to the manufacturing of metallic towers to wind turbines. This spin-off creation has been largely motivated by the Portuguese energy policy, motivated by the Portuguese government's strategic decision to invest in renewable energy like the wind and the solar, taking advantage of the natural conditions of the country. Martifer's know-how on metallurgical constructions and the national policy opportunities, conjugated with the trend about renewable energy all over the world (e.g., the Netherland first sea wind turbines, seen as symbols of a greener and prospect future society), fostered the creation of Martifer Energy Systems.



**Figure 6: Martifer's main events: time scale**

Based on our theoretical framework/model, the Martifer Energy Systems might be indeed classified as a technological spin-off, where the key vector elements of its creation were; 1) the strong human capital basis of the company in metallic manufacturing; 2) national business opportunity; 3) technological trends and international market prospect existent; 4) wind turbines technology potential; 5) and very strong shareholders, with high financial capacity, that could support the investment.

Derived from investments in Romania, in the sector of Agriculture and Biofuels, Martifer creates, in 2005, Prio, SA. Martifer took the opportunity of Romanian environmental funds, focused on the renewable energies, where the refundable financings went directly to the companies. In this way Prio, SA, owned in 60% by Martifer, started the agricultural production of oilseeds and the biodiesel production, in line with the investment in the greener energies. With this subsidiary, Martifer Corporation was able to access to all biofuel business chain value, and take advantage of the increasing

distribution network. Prio, SA, being also a technological spin-off, was born from the business opportunity and from the market prospect around the biofuel.

Still in 2005, Martifer continues its bet in wind towers, acquiring 25.4% share (12.5M€) of the German company Repower Systems AG, one of the greatest manufactures worldwide of wind turbines. In the same year, it was created REPower Portugal, SA. This company was shared equally between Martifer Energy Systems, SA and REPower Systems AG. This subsidiary gave Martifer access and control to the entire chain value wind towers' production, increasing Martifer's capacity of response in the sector.

Furthermore, and still in the same year of 2005, Martifer creates Martifer Renewables, SA, with the main purpose of centralizing management of all activities in the promotion and exploration of renewable energy. This company aimed the management of the energy power generation potentiated by wind or solar parks created by Martifer or a Consortium. As such, the specific know-how needed to handle and manage this kind of high tech energy parks pushed the creation of this technological spin-off.

Once more, analysing Martifer Renewables, SA according to our model (Figure 2), we can stated that it constitutes a technological spin-off, where the key vector elements of its creation were; 1) the strong human capital basis of the mother company in renewable energy; 2) national business opportunity (exploration required in the national public procurement); 3) synergies and complementarities that can be obtain; and 5) the existence of very strong shareholders that could support the investment.

In 2006, as product of the research made within Martifer Energy System in the sector of renewable energy, two different spin-off companies were created. The first, PowerBlades, SA, developed technology to wind turbines. And the second, Martifer Solar, SA, was responsible to develop photoelectric solar panels. Following our model, both companies are technological spin-offs, however the key vector elements of their creation were different. In case of Martifer Solar, SA, the main drivers were: 1) the strong human capital developed in the Martifer Energy System; 2) the national business opportunities; 3) the increasing international market prospect; 4) photoelectric solar panels technology potential; and 5) very strong stakeholders that could support the investment. In the case of the PowerBlades, SA, the main drivers were: 1) the technology potential; and 2) the synergies and complementarities that could be gain with the REPower Portugal, SA.

In 2007, Martifer created a new company the Martifer Inovação e Gestão, SA, centralizing shared services, an excellence center, and the research and development activities of the Martifer's Group.

In 2008, Martifer Energy Systems created a new spin-off, the Home Energy, SA, holding a share of 41.3%. This company aimed at the energy certifications required in property transactions starting from January of 2009, and also the segment of micro-generation of energy by installing solar panels. Analysing this Home Energy according our model the main drivers of its creation were: 1) the strong human capital developed in the Martifer Energy System; 2) the national business opportunities created with the new legislation; 3) the increasing market prospect; 4) the residential photoelectric solar panels technology potential; and 5) the very strong stakeholders that could support the investment.

In the same year Martifer agreed the selling of Repower System AG's share to the Suzlon. This operation permitted Martifer to receive 205M€.

In 2009, Martifer decided to redefine its strategy, following a refocus approach, reducing its interest in the sector of Agriculture and Biofuels.

In 2011, Martifer agreed to sell to the Repower System AG and Power Blade, SA, the REPower Portugal, SA.

### 3.3.3. The impact of corporeate spin offs on company's performance

Analysing the Martifer's corporation performance (Table 1), it is clear that during the period under analysis the company changed the strategy, trying to adapt to the international and national economic environment.

**Table 1: Performance results of Martifer (M€) from 2007 to 2010**

	2007	2008	2009	2010
<b>Martifer (consolidated)</b>	<b>37,0</b>	<b>67,1</b>	<b>66,8</b>	<b>59,0</b>
Martifer Aluminios	28,0	34,7	37,1	16,3
Martifer Energy Systems	na	na	na	na
REPower Portugal		17,2	11,2	-4,9
PowerBlade				
Martifer Renewables	-0,5	2,6	4,3	17,9
Martifer Solar		9,2	12,5	22,2
HomeEnergy			sold	

Note: na – not available

Source: Author based on financial reports of the company.

The first bet on wind towers, through the company REPower Portugal, showed very positive signs in a first stage but with the arise of the sovereignty public debt crisis the business prospects decreased drastically. This crisis has also affected Martifer Alumínios that in 2011 presented a negative EBITDA result of 20,1M€. According Martifer's financial report this result is explained by: 1) the unfavorable industry environment; 2) the negative margins in Eastern Europe and Australia; 3) integration of wind cluster in metal construction; and 4) the unexpected postponement of some projects in the portfolio, which to a large extent might be explained by the cuts in the public investment.

Given that, the results presented in the annual financial reports are by business sector activity, we fail to access the performance indicators by Martifer Energy System, as this firm is transversal to all business sectors considered - this company, which is based in engineering services, supports the other business units. Nevertheless, taking into account that it has generated several spin-offs, one might reasonably assume that its performance was positive.

The analysis of Martifer Renewables, leads to the conclusion that the energy generation sector evidenced very positive signs, maintaining a sustainable increasing return. Similarly, Martifer Solar evidenced a sustainable growth, which could be explained by the possibility to address the domestic electric market.

Summing up, the spin-off strategies permitted Martifer to growth and diversify. However, being its main activity very dependent on public investment, with the emergence of the international debt crisis the corporation showed a significant decrease in its performance, which could be much worse in the absence of the positive behavior of the Martifer Renewables and Martifer Solar, which compensated the negative performance of the other (more) traditional business segments.

### **3.4. EDP - Energias de Portugal**

#### **3.4.1. Brief description of the company**

The EDP Corporation is one of the largest companies in the PSI - Portuguese Stock Index, and ranks among Europe's major electricity operators. EDP has been created in 1976, through the fusion of 13 companies that had been nationalized in 1975. At that time, as a state-owned company, it was granted the responsibility to handle the



electrification of all country, electric distribution, planning and building of the domestic electricity generation, establishing of a single tariff for all customers. In 1991, the Portuguese government decided to modify its juridical status changing it to a corporation. In June of 1997 occurred the first phase of privatization of EDP, with the selling of 30% of the company's capital. After this phase, five more phases of privatization followed: May of 1998, June of 1998, October 2000, November 2004, and December of 2005. With the privatization, the company changed its strategy and ambition, starting the first steps towards the internationalization. This strategy led that the company to become the first Iberian company to own significant generating and distribution assets in both sides of the border. This was achieved with the acquisition of a controlling position in the Spanish company HC Energía.

Today it is present in several electricity sectors worldwide, with a major presence in the United States and Brazil, through the generation, distribution and trading businesses of electricity.

Initially the business activities of EDP were focused on the generation and distribution of electric power. However, the fast growth and the aim for business expansion led the company to enter in different (although highly complementary) areas, such as the gas exploration, engineering, and information technologies. The company has entered into businesses sectors, such as the IT Consulting through the Edinfor, or even telecommunications market through the ONI Telecom. Later on, given the scanty success in these sectors, the company sold the positions to Logica and to the Riverside Company.

In 2004, the company changed image and name to EDP – Energias de Portugal. In 2006, the company changed the positioning, and like the Martifer, this change was largely motivated by the Portuguese energy policy with its focus on the investment in renewable energy, namely the wind and the solar energy, taking advantage of the natural conditions of the country. This strategic change was followed by a new slogan “feel our energy”.

In December of 2011, Portuguese government sold its share in EDP (21,4%) to the China Three Gorges Corporation. This operation was largely motivated by the changing in government executive and by the agreement made with Troika (FMI, CEB, EC), within the Portuguese Stabilization and Growth Plan.

In the last years and led by Antonio Mexia, EDP corporation have increase the international expansion. This strategy has been based in three vectors; 1) controlled risk; 2) Efficiency; and 3) Oriented Growth. This vision has been (and will be) applied to three quadrennials: 1) 2006-2008: increase the investment in different areas and different options of growth; 2) 2009 -2012: focus on the execution and operationalization of the investment; and 3) +2012: to increase the cash flow earnings. This strategy was focused on business growth, through investment on sector complementarities to the core business.

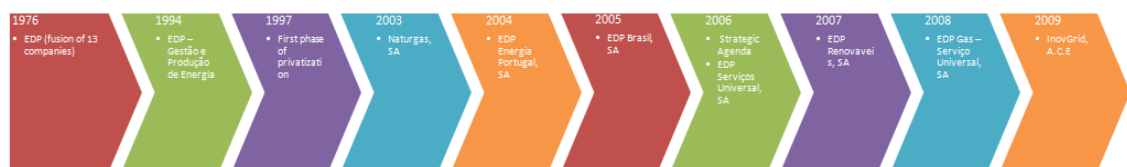
The strategy of value creation defined, was based in some principles that explain how the expansion was conducted, especially in what regards to the technology spin-off creation. In this way the EDP defined that the value creation should follow the following vales; 1) reach objectives; 2) create value through attractive investments; 3) low exposition to the market; 4) investments with high visibility and flexibility; and 5) focus on the efficiency and discipline.

Following the strategy routed, the company invests in the Iberia Peninsula, organizing the business in; 1) Energy Production (with long tail production contracts, liberalization energy production); 2) Energy Distribution; and 3) Energy Commercialization. In addition, the company decided to invest in the natural gas, following the global consumer trends that demands cleaner and cheaper energy.

Internationally the company continued the investments made in Brazil, increasing its position in what was considered strategic market for the company.

### 3.4.2. Corportate spin offs' decision process

Figure 7 depicts some of the main events which marked EDP over the last years and which are detailed in what follows.



**Figure 7: EDP's chronological main events: time scale**

In 1976, after the revolution of 25 April 1975, the Portuguese regime change from an authoritarian dictatorship (the Estado Novo) into a democracy, that produced enormous social, economic, territorial, demographic, and political changes in the country, creating

a two years transitional period known as PREC (*Processo Revolucionário Em Curso*, or On-Going Revolutionary Process), characterized by social turmoil and power disputes between left and right wing political forces. EDP emerged through the fusion of 13 companies.

In 1994 it was created the EDP – Gestão e Produção de Energia, aiming at promoting and managing all EDP's facilities, ventures or activities in sector of production and energy selling, in the form of electricity. This company had the objective to elaborate studies or develop projects related with the energy production or commercialization. Applying our model, this company was not a technology spin-off, being triggered by business motivations. The main drivers of this creation were; 1) the strong knowledge existent in EDP; and 2) company reorganization sector activity.

In 2003, and within the scope of the privatization process of Naturgas Energia Grupo which occurred in 2003, Hidroeléctrica Del Cantábrico. (HC), (96,86% owned by EDP) acquired a controlling stake in Naturgas and closed with Ente Vasco De La Energia (EVE), a shareholder agreement valid until July 30th, 2010, which included a put option for part or the whole of EVE's stake in Naturgas, to be exercised at market value until July 30th, 2010. This operation, gave EDP access to the gas activities of distribution in low pressure and commercialization on the regions of Canábria and Múrcia and the activities of high pressure gas on the regions of Pais Basco, Asturias and Cantábria for the value of 330 Millions of Euros.

The completion of this transaction depended on some required approvals, in particular the approval by the Basque Country's parliament. With this deal HC will reinforce its position in Naturgas to 95% until the end of the first half of 2013, having the possibility to own the whole capital of the company from 1st of June 2016. This is an important step in EDP's consolidation of its Spanish shareholdings and gas Iberian operations, increasing efficiency improvement possibilities and the achievement of additional intra group synergies.

Naturgas operates in the distribution, transmission, purchase and sale of natural gas in Spain through 8,736Kms of distribution network and 974 thousand of points of supply, a 387Kms transmission network, and natural gas sales of 2.5bcms/year (29TWh) to its 822 thousand supply clients.

Applying our model in order to explain the acquisition, it is clear once more that behind this operation was business motivations. Despite this operation has been made in 2003, it followed the same strategic principles communicated in 2006. The acquisition although have involved a considerable investment, had low risk, very low exposition to the market, and high visibility. The main drivers of this acquisition were; 1) the strong knowledge existent in EDP in sector distribution and commercialization; 2) seeking to diversify and enter in the natural gas sector; 3) definition of Spain as one of primary markets to expand; 4) trend on consumer habit of natural gas; 5) strong shareholders that made possible the investment, and 6) the complementarities expected to have with the Energy production.

In October of 2004, the company changed the name, from EDP – Electricidade de Portugal, SA to EDP – Energias de Portugal. It was not clear why this was made. However, analyzing the strategy that was communicated in 2006, and the different investments made in previous years, namely the acquisition of Naturgas, the name change may have been a consequence of the company market reposition, as earlier referred.

In 2005, it is created the EDP – Brasil, aiming to promote, and manage, all facilities, projects and activities in the production and sale of energy, particularly in the form of electricity in the Brasil. The company is a holding managing several activities in a few states like São Paulo, Espírito Santo, Mato Grosso do Sul, Tocantis, Ceará, among others.

In 2006, EDP communicated its long run strategy, making public the interest in the renewable energies. Still in 2006, it was created the EDP – Serviços Universais, which was a company with the purpose of buying and selling electric energy, working as a supplier of last resort. The company holds a license of supplier of last resort, issued by the Directorate General for Energy and Geology (DGEG), and it was subjected to a set of public service obligations, including: universal provision of electricity supply to all customers eligible upon request, protection of consumers. Applying our model in order to explain this creation, it is clear once more that behind this operation was business and profit seeking motivations. In this way the main drivers of this creation were; 1) the strong knowledge existent in EDP in sector of distribution and commercialization electricity; 2) strong stakeholders that made possible the investment and also make

possible to buy the license of supplier of last resort; 3) to defend market position; and 4) the complementarities expected to have with the electrical production.

In 2007, it was created the EDP – Renovaveis, with purpose to explore, develop and manage renewable energy, establishing its headquarters in Madrid. Today EDP Renováveis is the third-largest generator of wind energy worldwide (after Iberdrola Renovables and NextEra Energy Resources), being one of biggest Portuguese companies, is present in the PSI-20.

EDP took advantage of the European Policy defined in European Commission, which encouraged the countries to invest in renewable energy. This was followed by several countries like, Portugal, Spain, Poland, among others. In case of Portugal it was considered a strategic investment by the left wing government of José Socrates, seen as a way to reduce the country's energetic dependency.

Applying our model in order to explain the EDP – Renovaveis' emergence it is clear once more that behind this operation stood business and market prospect and opportunity. However, we consider that this company is a technology spin-off. Our arguments are based on the fact that the EDP Corporation has been developing work in their R&D labs in order to explore other forms of energy creation like wind and solar energy. In this way the main drivers of this spin-off were; 1) the strong knowledge existent in EDP in sector distribution and commercialization; 2) the human capital acquired in their R&D labs about renewable energy; 2) need to diversify and enter in the green energy; 3) market potential, national (exploration required in the national public procurement) and international; 4) trend on consumer demands; 5) strong shareholders that made possible the investment; and 6) the complementarities expected to have with the Energy production like Hydro (Electric Dams, and the possibility use the very low cost of electric energy in dawn to invert the water flow and fill the reservoir) and Energy Distribution.

In 2008, it was created the EDP Gás Serviço Universal, owned in 100% by EDP – Energias Portugal, which is a company that has the purpose of buying and selling natural gas, working as a supplier of last resort, for the concession zone given to EDP Gás e Distribuição, being responsible for the supply of gas in the regulated market. The access to the license of supplier of last resort of gas is in line with the strategy defined, leveraging the infrastructure that had been invested, using synergies and complementarities with the several companies of gas, but also with the sector of

electricity. Applying our model in order to explain the creation of this company, it is clear once more that behind this operation was business and profit, aimed at reaching the Business to Consumer (B2C) market. In this way the main drivers of this creation were: 1) the strong knowledge existent in EDP in sector of distribution and commercialization electricity; 2) the strong knowledge existent in EDP in sector natural gas; 3) strong shareholders that made possible the investment and also make possible to buy the license of supplier of last resort; 4) hold market position; and 5) the complementarities expected to obtain with the electrical sector and with the business area of gas.

In the recent years it was noticed a slowdown in the investment activities, which is aligned with the strategy defined for the period. However, some of the new companies that have been created are performing R&D activities in new and thrilling areas, like the Smarts Grids, and Electricity consumer Telemetry. This is expected to increase drastically the efficiency of EDP Network, and give this latter the access to new different business in some way related, denominated of Machine 2 Machine (M2M). In some way the M2M is not a market itself, but an extension of multiple vertical businesses that benefit from M2M communications (like the SmartGrids). The scope of M2M is quite broad, having potential to enhance the existing process in several industries, such as energy, retail, healthcare, automotive, manufacturing, to name but a few. The market potential is enormous, and the creations of these new companies (i.e, these technological spin-offs) are the proof that EDP is in front line of new technology and new market opportunities. On example of these new companies is InovGrid that is a consortium of several companies, which are developing the SmartGrid and a SmartCity in Évora.

Applying our model in order to explain InovGrid emergence, we conclude that it was based on market opportunity and efficiency increases. It is without doubt a technology spin-off. Its main drivers were; 1) M2M market potential; 2) trend on consumer habits demanding new and more advance services; 3) increase of electrical network efficiency; and 4) the complementarities expected to have with the all business areas of EDP.

### **3.4.3. The impact of corporate spin offs on company's performance**

Analysing the EDP's corporation performance, it is clear that during the period under analysis the company has maintained the strategy and focus and, despite the

international and national negative conjecture, there was no desire/need to change the strategy.

During the period in analysis EDP showed strong activity and dynamism, performing acquisitions, operational restructures, selling what it thought that did not belong to company's core business or what was not a good investment (e.g., ONI Telecom).

The data in Table 2 shows that the enormous growth observed during the period in analysis (~1000Millions of Euros) was only possible with the business diversification in the energy sector. The activities in gas and, more important, the bet in the wind energy played a huge role in the performance achieved. Looking to the growth in the period operational profits, half of it is from the EDP Renovaveis, reflecting the importance of this strategic investment, drove from business opportunity, and technology know-how.

EDP has traced a secure path, focused on the routed strategy, investing in technological spin-offs only when are certain of a successful outcome.

Despite one of their biggest success (EDP Renewables) being responsible one of a spin-off, the defensive behavior of the company could be justified by the position in market, that being incumbent leader, does not feel the need to take risks in market or uncertain technologies.

**Table 2: Performance results of EDP (M€) from 2007 to 2010**

	2007	2008	2009	2010	Average growth rate (%)
Electricity production in the Iberian Peninsula	1225	1172	1374,9	1235,1	0,9
Electricity Production in the Iberian Peninsula Contracted Long-Term			823,2	876,7	
Electricity Production in the Iberian Liberalized		323	551,7	358,4	
Electricity Trading in the Iberian Peninsula		32	54,7	58,2	
Electricity Distribution in the Iberian Peninsula	455	770	670,9	697,8	
Gas in the Iberian Peninsula	188,5	209	217,5	273	13,5
Renewable (Wind)	214,5	438	542,5	712,7	53,1
Brasil	586	562	550,2	674	5,4
Other	-42	-30	-47,9	-38	
Consolidated	2628	3155	3363	3612,8	11,4

Source: Author based on financial reports of the company.

### 3.4.4. EDP Renewable

#### Brief description of the company

EDP Renováveis is a worldwide leading company in renewable energy. As referred, it was created in 2007 with purpose to explore, develop and manage renewable energy for the EDP Corporation. In a short period of time, the company became the third-largest generator of wind energy globally (after Iberdrola Renovables and NextEra Energy Resources). Today the company is one of largest Portuguese companies present in the PSI-20 and one of the few with leading technology worldwide.

After the European Council in Lisbon (March 2000), where it was defined the vision and objectives for the Europe of 2010, which enlightened the need to lay the strategic path in a sustainable economic growth in order to achieve more and better jobs and greater social cohesion. It was concluded that the EU had a strong energetic dependency (e.g., on natural gas, petroleum, coal) from other regions. In this way the EU encouraged investment in green energy, seeking to take advantage from the natural conditions of each country. During this period the European R&D investments in green energy spurred seeking the economic sustain.

The EDP Renováveis was created from the very beginning with an international orientation, multiplying international operations in Europe, Brazil, and even in United States through various businesses.

#### Corporate spin offs' decision process

The next figure represents some of the main events around the EDP Renováveis Corporation that will be discussed briefly.

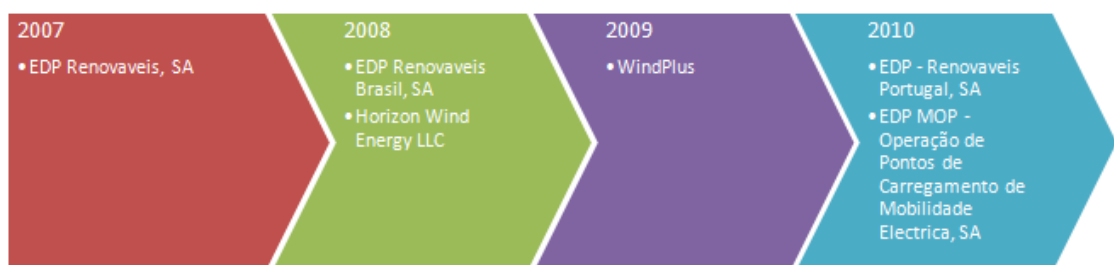


Figure 8: EDP Renováveis's chronological main events: time scale

After EDP Renováveis' creation (in 2007) it was created, in 2008, the EDP Renováveis Brasil, holding and managing all investments concerning the green energy. Like the



EDP – Brasil, the EDP Renováveis Brasil was created to promote and manage all facilities, projects and activities in the production and sale of renewable energy in Brazil. Currently the company owns activities in a few states like Rio Grande do Sul and Santa Catarina. Applying our model in order to explain this creation, it is apparent that behind this operation was business and operational efficiency. In this way the main drivers of this creation were: 1) the strong knowledge existent in EDP in sector of distribution and commercialization electricity; 2) strong shareholders that made possible the investment; 4) hold market position; and 5) the complementarities expected to have with the Electrical production.

Still in 2008, the company Horizon Wind Energy became part of EDP Renováveis. The company was bought by EDP – Energias de Portugal in 2007 for \$2.15 billion. The company has changed its name in 2011 to EDP Renewables North America LLC. The company Horizon Wind Energy is a holding of several North American Projects in wind energy. It has developed wind farms in New York, Iowa, Pennsylvania, Washington, Oklahoma, Minnesota, Oregon, Texas, Indiana and Illinois, like Blue Canyon Wind Farm, Elkhorn Valley Wind Farm, Lone Star Wind Farm, among others parks. Applying our model in order to explain this investment, we conclude that the motive behind this operation was business strategic international positioning. Our analysis points that the main drivers of this investment were: 1) the strong knowledge existent in EDP in sector of distribution and commercialization electricity; 2) the strong knowledge existent in EDP in wind energy sector; 3) strong shareholders that made possible the investment; 4) market opportunities; and 5) defend market position.

In 2009, the company WindPlus was created with the purpose of developing a new technology called WindFloat. The WindFloat is a floating structure, with a patented supporting offshore wind turbines. It is an innovative structure aimed at smooth the motions induced by waves and wind. Thus, it is possible to deploy wind turbines offshore where wind resources are superior in previously inaccessible locations (where the water exceeds 50 m depth). This is clearly a technological spin-off. Applying our model in order to explain its creation, we might state that it was drivenr by the opportunity that this technology could bring. Our analysis further points that the main drivers of this investment were: 1) the strong knowledge existent in EDP in wind energy sector; 2) strong stakeholders that make this investment; and 3) market opportunities worldwide.

In 2010, it was created EDP Renováveis Portugal holding and managing all investments, facilities, projects and activities in the production and sale of renewable energy in Portugal. Applying our model in order to explain this creation, again behind this operation was business and operational efficiency, following the same strategy of other international operations. In this way the main drivers of this creation were: 1) the strong knowledge existent in EDP in sector of distribution and commercialization electricity; 2) strong stakeholders that made possible the investment; 3) hold market position; and 4) the complementarities expected to have with the Electrical production.

Still in 2010, it was created the EDP Mop - Operação de Pontos de Carregamento de Mobilidade Eléctrica with the objective of managing all activities related with the electrical recharge points located in the road sector (electrical cars, electrical motors), integrated on what was called the Portuguese electrical mobility network. The company aims also other service or activities that could be related with this. This network was design by the former government, following the strategic investments in green energy. With this network the Portuguese government tried to encourage the adoption of green vehicles, reducing in this way the energetic dependency on fuel. Applying our model in order to explain this investment, it is clear that behind this operation was business opportunity. In this way the main drivers of this creation were: 1) the strong knowledge existent in EDP in sector of distribution and commercialization electricity, 2) strong shareholders that made possible the investment, 3) hold market position and 4) the future market opportunity.

### **The impact of corporate spin offs on company's performance**

Analyzing the EDP Renováveis's performance it evidences impressive growth rates (cf. Table 3). Thus, despite international and national negative conjecture there was no need to change the strategy.

**Table 3: Performance results of EDP Renováveis (M€) from 2007 to 2010**

	2007	2008	2009	2010	Average growth rate (%)
Operational Results	214,5	438	542,5	712,7	
Growth Rate (%)		104,2%	23,9%	31,4%	53,1%

*Source:* Author based on financial reports of the company.

During the period under analysis the company showed a sustainable growth, maintaining a high rate growth.

Despite the international conjecture in several industrializes countries, according to World Wind Energy Association<sup>4</sup> the emerging markets like India and China are taking the lead in this domain. Having this in mind, the latest acquisition of 21,4% of the EDP's Corporation by the China Three Gorges Corporation, opens huge opportunities to EDP Renováveis as according the World Wind Energy Association the global wind power growth looks very strong and is on a continued rise largely because of China's incredible level of investment.

### **3.5. Galp Energia**

#### **3.5.1. Brief description of the company**

The Galp Energia Corporation is one of strongest companies in Portugal and thereby one of the top companies in the PSI-20. The company developed several activities in the petroleum products and natural gas, which extend from exploration and production of oil and natural gas, refining and distributing petroleum products, distribution and sale of natural gas and electric power generation.

After the military coup in 1974, Portugal handed over power to its overseas provinces. In Portugal, Petrogal was formed in April 1976 from four Portuguese companies — SACOR, CIDLA, SONAP, and Petrosul — that were nationalized following the revolution of April 1974.

Galp Energia was created on April 22, 1999 under the name of Galp - Oil and Gas de Portugal, SGPS, SA aiming the exploration of the business of oil and natural gas following the restructuring of the energy sector in Portugal.

Galp Energia included Petrogal, the only major refiner and distributor of petroleum products in Portugal and Gas de Portugal, importer, carrier and distributor of natural gas in Portugal.

Galp Energia's initial public offering on the Lisbon Stock Exchange took place in 2006.

The Galp Energia today have a very strong presence in the business of distribution of petroleum products in Spain and in the African continent, particularly in Cape Verde, Guinea-Bissau, Mozambique and Angola.

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<sup>4</sup> World Wind Energy Association – from <http://www.wwindea.org> at 2 June of 2012.

From the start the company defined as strategy to growth and to be transformed into an integrated operator of energy present in a relevant way across the value chain of the Oil & Gas sector. In 2008, the company decided to change the positioning and despite the goal to become an integrated operator continue to be same it is decided to repositioning the company as multi-energy supplier. The company decided to implement an ambitious strategy, which aimed at developing their potential for multi-operator, creating long term value for its shareholders. The strategy was based in two key vectors; 1) to increase the competitive capacity in the markets where the company is present; and 2) to increase and intensify the efforts to innovate, and to increase the quality and safety.

During this period, the company engaged in activities to increase projects which could enable, on the one hand, the long-term supply of oil and natural gas and, in other hand, to provide supply to its markets in Portugal and Spain. The company established as long term objective to achieve a sustained production of 150 mboepd (Thousand Barrels of Oil Equivalents Per Day). This objective was 10 times the volume of the production of 2007. Toward this end, Galp Energia acquired, in 2007, stakes in 20 blocks in several countries, seven of which were acquired in the ninth round of bidding organized by the Brazilian Government.

In this way, presently Galp Energia can be considered as an integrated operator, with strong presence in all value chain of the oil and gas sector, extending the operations to emergent markets of the renewable energies. All activities are with strong expansion at a global scale, being present mainly in Portugal, Spain, Brazil, Angola, Venezuela, Mozambique, Cape Verde, Guinea-Bissau, Swaziland, Gambia and East Timor.

### **3.5.2. Corporate spin offs' decision process**

In this activity all projects have a very long period of gestation. Despite this, the constant search for new opportunities is an essential factor to ensure long-term growth. In 2007 the Galp Energia added 20 new projects of exploration to its portfolio and secured its presence in offshore basins with high potential in Portugal, Mozambique and East Timor. The smaller size of Galp compared with other oil companies coupled with an effective capacity of Galp Energia to participate in integrated international operations with other large players allowed the company to benefit from being a standard bearer of Portugal in the capture of new opportunities with strong added value for shareholders and control of geological and political risks.

Refining and distribution are main areas of business of Galp Energia and from the beginning that the company has invested in these areas trying to extract the most value possible from its assets. In this way the company has two refineries and a distribution network for petroleum products with a high profile in the Iberian Market. The company has modern refining facilities in the Iberian Peninsula, connected to an efficient logistics network that allows supplying Portugal from north to south and the Azores and Madeira. With a combined capacity of (2007) 310 thousand barrels daily, the Sines and Porto processed crude oil from more than 10 countries for a wide range of products which stand out the gasoline and middle distillates. This strong capacity provides the availability to control the fuel market in Portugal, as the only refineries existent in Portugal belong to Galp Energia.

Also, while incumbent of the natural gas business in Portugal, Galp Energia is determined to manage the transition to the new regulatory framework, which will lead to a liberalization of the market in order to preserve the value of business in the new context. Galp Energia have led the process of introducing natural gas in Portugal, which started 10 years ago, participating in all phases of development of this sector in Portugal, including the construction of the infrastructure, from high to low pressure and helping to create the natural gas market in Portugal.

Presently, Galp Energia holds contracts for the supply of natural gas from Algeria and Nigeria to reach more than 6000 million cubic meters per year, supplying the whole of mainland Portugal, where was sold 4.2 billion cubic meters in 2007.

Back in 2007, the company was looking to become a multi-energy supplier, investing on three cogeneration plants with an installed capacity of 800 MW. However, and according with its annual report of 2007, the challenge was to develop a portfolio of competitive generation with a capacity of 1,200 MW by 2010, including cogeneration plants, wind farms and combined cycle plants, and continuing to seek opportunities to develop new projects in Portugal, particularly in hydropower generation. This plan was in some way aligned with the energetic policy strategic of the former government, which represented huge opportunities for some companies, most notably Galp Energia.

Still in 2007, Galp Energia obtained the license to sell electricity in Portugal in the liberalized market, being able to formally start business, planning to enter 2008 in the wholesale electricity market. Additionally, Galp Energia obtained the production license to build a combined cycle power plant in Sines, with an installed capacity of 800 MW,

which according to the company was an important step in the production of electricity market regime. With this investment, Galp Energia planned to not only enter in market with high growth but also explore synergies with the area of natural gas.

Following the launch of the National Plan for High Potential Dams (PNBEPH - *Plano Nacional de Barragens de Elevado Potencial*) (), in 2007, Galp Energia decided seeking to add capacity to its portfolio of hydroelectric power generation, thereby complementing the capacity of thermal power generation with renewable energy production. In this same year Ventinveste consortium, lead by Galp Energia with a 34% stake, won the B phase of the public tender for allocation of points for approval of wind that came to assign a power of 400 MW, which could reach 480 MW. The eight parks planned in the project should become operational by 2013. The sale of electricity from wind farms is subjected to special arrangements. For instance, in cogeneration plants the sale is guaranteed by volume and a regulated tariff in the first 15 years of the project or until it reached a production of 33 GWh per MW installed.

In 2008, Galp Energia started The Wind Project @ Sea aiming the assessment of wind power in the west coast of Portugal, for the identification, selection and characterization of sites for offshore wind farms. The initiative was developed by the consortium of composed by Galp Energia (the leading developer), INETI, Hydrographic Institute, and INEGI (National Institute of Engineering and Industrial Management ).

The year 2009 was a turning point in the biofuel sector in Portugal and Spain with the entry into force of mandatory incorporation of biofuels in road fuels. In anticipation of this statutory requirement, Galp Energia had already begun to introduce these products from renewable sources in day-to-day, constituting itself as a pioneer company in promoting sustainability in road transport.

In 2010, Galp Energia increased its stake from 34% to 49% in a wind project, which corresponds to 200 megawatts of installed capacity. Galp Energia has the expectation that, in 2013, the installed capacity of 200 megawatts is fully operational. In the fourth quarter of 2010, the company began the construction of the Grand Valley wind farm with an installed capacity of 12 megawatts, expected to be completed in 2011, which is a step forward the strategy defined to become a multi-energy supplier.

The net entitlement production of crude oil in 2010 increased 22% compared to that of 2009 to 11,800 barrels daily, which prove that the expansion and investments that the

company undertook started to give returns. Also the investment made in the refineries started to be translated into higher margins. In 2010, the net result of Galp Energia was € 306 million, 43% higher than in 2009, which was due to improved operational performance of Gas & Power and Refining & Marketing business segments.

### 3.5.3. The impact of corporate spin offs on company's performance

Analyzing the economic performance of Galp Energia, despite international and national negative conjecture there was no need to change the strategy.

**Table 4: Performance results of GALP Energia(M€) from 2007 to 2010**

	2007	2008	2009	2010	
Exploration & Production	233	200	168	214	Average growth rate (%)
Refining & Distribution	11115	13224	10620	12388	
Gas & Power	1455	1942	1425	1735	
Operational Results	12557	15062	12008	13998	
Growth Rate (%)		19,9%	-20,3%	16,6%	5,4%

Source: Author based on financial reports of the company.

During the period under analysis the company did not use the technological spin-off as a management instrument, having a conservative approach to business and to the market opportunities.

Despite the intention, communicated in several annual reports, of wanting to pursue a strong international expansion, the fact is that all steps made were mainly towards the increase of its current activities, or towards the increase of the operational efficiency. Even the repositioning of the company as multi-energy supplier did not bring any change on its approach to the business.

The behavior of Galp Energia reflects that of an incumbent trying to monetize their operations to the maximum, focused on the increase of operational margins, and in this way provide the maximum yield to its shareholders.

### **3.6. Sonae**

#### **3.6.1. Brief description of the company**

Sonae is one of the largest companies in Portugal, being the largest private employer. The company operates in diverse businesses activities, from the telecommunications and information technology services, to real estate development, or even tourism and other related activities through its holdings like, Sonae Sierra, Sonaecom, or Sonae Distribuição.

The company is headquartered in Maia (North Portugal), employing about 39,000 people. The chairman and main shareholder is Belmiro de Azevedo, one of the most influent and respected Portuguese businessmen.

The company was created in 1959, in Maia, in the wood business, but more particularly in the production of high-pressure decorative laminates. The company name was originally an acronym for SOciedade NAcional de Estratificados (National Company of Engineered Wood). This was the core business, which is now fully integrated into an autonomous spin-off, the Sonae Indústria.

The company stayed focused in the wood sector market during several years, remaining as a small/medium company. After the military coup in 1974, the company was nationalized. However, it was rapidly privatized when the political stability returned.

After this, Sonae began a process of diversification and expansion in line with the positive climate of growth that the country and the Europe experienced. This led Sonae to acquire a supermarket chain, following the launch of the first hypermarket in Portugal, and later the development of the shopping center business.

The company had defined as key strategy “stay focus” in their core business. As outcome of this strategy, the Sonae Imobiliária (Real Estate) became its first spin off. It was created having as main objective the construction of shopping centers anchored by Sonae stores. The company built the Cascais Shopping in 1991 and the Centro Colombo in 1997. These were on the first super shopping centers in the Iberian Peninsula.

Applying our framework to analyze the main drivers of this spin-off, we can point that these were: 1) the strong knowledge existent in sector of real state; 2) the trend that exist in other countries in Europe and in USA, and in this way the market prospect; 3)



the need to leveraged the Sonae stores; 4) the strategy of focus; 5) hold market position, and 6) investment capacity.

At the same time, Sonae invested in many different areas such as telecommunications, information technology, leisure and tourism. In 1994 created the holding to handle these areas. Sonaecom assumed its present name in 1999. Sonaecom is the sub-holding of the Sonae Group for the Telecommunications, Media and Software and Systems Information (SSI), playing an active role in the integrated management of business units that correspond to it, identifying and exploiting existing synergies and potential company's growth.

From its beginning the company pursuit expansion through the spin-off of new companies, or moving to new business through joint-ventures, as the ones made with France's Continent (later Carrefour) for hypermarkets, France's Champion (later Carrefour) for supermarkets, Germany's Vobis for computer stores, France Telecom for telecommunications, Brazil's Emplanta.

An example of this was the creation of the Optimus, operation that started on September 1998, against the two longer-established operators TMN and Telecel, now a subsidiary of the Vodafone Group. This was made through joint-venture with France Telecom that enabled Sonae to acquire the necessary know-how to handle a telecommunication operator.

In 1996, and following the strategy of maintain the focus on the core business, and facing the strong international growth, it was decided to split the holding Sonae Indústria in two. In this way was spun-off a new company to lead to the emerging businesses (including software and telecommunications). This company was called Inparsa SGPS, SA.

Later on, in September of 1999, there was a major reorganization of the group. It was decided that the Sonae Investimentos SGPS should reacquired Inparsa SGPS, and simultaneously to acquired Figest. Furthermore, it was decided to simplify the formal name of the company, changing it from the formal name Sonae Investimentos SGPS, SA to the new simplified Sonae SGPS, SA.

### **3.6.2. Corporate spin offs' decision process**

From the beginning Sonae defined that the group should maintain the focus on their core business, but also, should increase their operations through business diversification. These should be obtained through the prospect of other forms of value creation, intervening and supporting businesses in areas where the experience of the holding represents an advantage. Such a combination would lead to an increase in value through: 1) cooperation in developing strategies and objectives; 2) allocation of capital by sub-holdings and business opportunities; 3) seeking proactive and continuous opportunities for M&A; 4) human resources centralization of top management; 5) proactive management of institutional relations; and 6) leverage the brand, size and internal powers of Sonae.

Sonae defined as key vector to the group growth the internationalization, stay focused on the company core business and in the adjacent business areas. According to Belmiro Azevedo (in the Sonae SGPS's Annual Report of 2008), the strategy of the group was to be leveraged by the emergent countries with high growth rates and by mature markets. In geographic zones with strong economic growth but with retail markets still in development, should be given giving preference to countries with better governance practices and better political stability. In mature markets where the company was already present, the goal was to seek growth opportunities in different concepts that the company skills could provide a clear competitive advantage and positive value offer. It was the chairman's ambition that Sonae by got by 2012 25% of its turnover and 35% of its assets linked to international operations.

Sonae defined as a cornerstone the holding, which would generate the most of value added and growth to the group. This should be obtain through a simple and agile management structure at the holding company level, designed to allow each sub-holding have its own management team, in total dedication, focused on developing their own strategies, based on specific factors of the business, having in this way increased operational efficiency.

The companies admitted to participate in other projects where despite not having the share control, could see in the partner(s) specific know-how that they did not possess or where the contribution of Sonae could provide superior economic value to the partnership. In these circumstances the company would promote consolidation processes and other restructuring moves, increasing the overall efficiency. For Soane,

the role of partners played a critical role, especially in new geographies, where the partners would have the ability to provide technical support and to develop the necessary high level professional network , vital for the business success. According with the annual reports of 2007 and 2008, this strategy could divert more than 10% of the Group's capital employed in the business that does not have controlling stakes.

In the beginning of 2009 Sonae announced its corporate strategic guidelines for future growth, stressing that the main goal was to transform the company into a major multinational. Sonae began positioning itself as a retail company in the shopping centre and telecommunication businesses. It made clear its belief that international expansion was its key strategic objective and also a requirement given the constraints to growth in Portugal. This expansion would be achieved by entering into new markets with concepts that were considered to have a clear advantage over the competition.

Moreover, innovation was considered as one of the key pillars of sustainability and long-term differentiation and in this way Sonae tried continuously to explore and examine opportunities with potential for value creation. Sonae underlined that innovation makes part of their culture and attitude of all employees and partners, and, in this way, a competitive and differentiator factor.

Presently, Sonae is composed by several sub-holdings, grouping the hundreds of companies by business sector: 1) Sonae Industria; 2) SonaeCom; 3) Sonae MR (Food , Retail) and Sonae SR (Specialized Retail) – (called Sonae Distribuição); 4) Sonae Sierra and Sonae RP (Property Retail) (called Sonae Sierra);5) Sonae Investimento and 5) Sonae Capital.

Figure 9 depicts some relevant events under the period of analysis which can help to understand the growth strategy defined.



**Figure 9: Sonae's relevant chronological events: time scale**

During the period in analysis (2007-2010), there were several important events, which can be explained by the position of the company. In 2007 the company was very aggressive, having and moved countless operations of acquisitions. We underline two operations: the acquisition of Carrefour Portugal, in line with the company strategy, and the creation of joint-ventures to gain specific-know and to increase the business performance. In 2007 Sonae launched a takeover bid for PT (Portugal Telecom). This operation, however, was not successfully concluded due to several factors, including the failure to unlock the status of PT. Notwithstanding, such operation spurts the emergence of PT Multimedia (now called ZON-Multimedia), a spin-off of PT Corporation , repositioning the fixed telecommunications market.

### 3.6.3. The impact of corpportate spin offs on company's performance

Between 2007 and 2010 the company performance slow downned. This might be explained by the cooling of the global economy and by the difficult to access to financing. Nevertheless, the company continued to show positive growth rates, despite negative conjecture (see Table 5).

**Table 5: Performance results of Sonae SGPS (M€) from 2007 to 2010**

	2007	2008	2009	2010	Average growth rate (%)
	4417	5353	5665	5914	
Growth Rate (%)		21,2	5,8	4,4	10,5

*Source:* Author based on financial reports of the company.

Given the complex structure of Sonae, we considered critical to detail the most relevant business segments of Sonae.

### 3.6.4. Sonae Indústria

As referred, Sonae Indústria's core business was originally the high pressure decorative laminates called Sociedade Nacional de Estratificados (Sonae), have being created in 1959. Today Sonae Industria is dedicated to engineered wood, being itself a spin-off from Sonae SGPS.

Applying our model to this company's setting, we can state that the main driver of the spin-off was the clear intention of intensify the focus on the core business of engineered wood.

The business ‘autonomy’ of Sonae Indústria happened in 2005. This operation consisted of a split of part of the shareholding held by Sonae – SGPS, S.A. in Sonae Indústria – SGPS, S.A. and its integration in Sonae 3P – Panels, Pulp and Paper, SGPS, S.A.. Today it is one of the world leaders in the wood-based products sector. This position was achieved after the takeover of the German company Glunz AG, in 1998, followed by an organic growth. This helped to consolidate the company’s globalization process.

In these last years Sonae Industria has maintained its focus on the production, and no venture operations mergers or acquisitions where undertaken. This can be explained due the slowdown of the global economy, which also justifies the poor performance of the company (cf. Table 6).

**Table 6: Performance results of Sonae Indústria (M€) from 2007 to 2010**

	2007	2008	2009	2010	Average growth rate (%)
	2066	1769	1283	1293	
<b>Growth Rate (%)</b>		-14,4	-27,5	0,8	-13.7

*Source:* Author’s, based on financial reports of the company.

### 3.6.5. Sonae Distribuição

Sonae Distribuição was created in 1985 by the operation of merging two large retailers, Modelo and Continente. Modelo was owned by the Sonae, while Continente was the Portuguese and Spanish operation of the French retailer Promodès, known by the ensign Continent. In fact, Continent was in part owned by Carrefour, a French company, that sold their share to Sonae for €345 million on 16 November 2004. In the end of 2007, Sonae bought Carrefour Portugal to Promodès.

The company evolved for two distinct areas: 1) basic food retail, including Continente hypermarkets (with an average sales area of approximately 8,000 m<sup>2</sup>), hypermarkets Modelo (with a sales area of approximately 2,000 m<sup>2</sup>), and supermarkets Modelo Bonjour (with a sales area of approximately 1,000 m<sup>2</sup>); and 2) non-food retail, including the Worten (appliances and consumer electronics open in 1995), Sport Zone (sporting goods), and Modalfa (ready-to-wear, open in 1997). This strategy have continued in order to expand company business portfolio, and also pursuing synergies with the Sonae Group. This lead to the development of new formats in the non-food

area, namely Zippy (clothing for children and babies that opened in 2004) and Worten Mobile (expert in the field of telecommunication equipment also opened in 2004).

In 2007, the priorities of Sonae Distribution focused on capitalizing the previous initiatives trying to consolidating the leadership in the Portuguese market. The strategy was leveraged through the opening of new stores, and as well developing new business formats and investment in efficiency programs and innovation by launching initiatives targeted consumer loyalty end.

In 2009, the company decided to perform reorganization, in line with other operations to maintain the focus on the core business. In this way, Sonay Distribuição was split in two companies. Sonae MC, focused on the food retail segment, and the Sonae SR, focused on the Specific Retail operations.

Its market position has been achieved through a long term strategy based on: 1) a strong knowledge of the market, allowing them to provide reliable service and high quality to all customers; 2) continued investment in innovation, aiming at the differentiation; 3) enhancing operational efficiency through improved information systems, modernization of logistics and personnel training; and 4) a strong brand, with one of the highest levels of reputation and confidence.

In 2009, progress was made towards the international expansion. This was obtained mainly by strengthen the presence in the Spanish market with the opening of 22 stores, totaling 22 thousand m<sup>2</sup>. At the end of 2009, the company had three different operations in Spain: 1) Worten, with 14 stores totaling 34 thousand m<sup>2</sup>; 2) Sport Zone (with 14 stores totaling 17 thousand m<sup>2</sup>; and 3) Zippy (Kids clothing) with 10 stores totaling 4 thousand m<sup>2</sup>.

Despite the slowdown of the global economy, the Soane Retail maintained a very positive performance as can be seen in Table 7.

In the retail food sector, the total income continued to growth, however with a slight slowdown in the years of 2009 and 2010. Again these can be explained by lack of consumer confidence and purchases after the international financial crisis. Sonae has fought against this putting forward some interesting strategies to guarantee the customer loyalty: 1) customer loyalty card; 2) strong investment in the brand; 3) promotions and discounts.

In the non-food retail sector, the economic performance continued to evidence strong growth rate, around 17%, being already 40% of income of retail. The strategy of leveraging the know-how in retail for different sector, through the opening of new companies, has been a huge success. Applying our framework to analyze the main drivers of these spin-offs, we can point that were: 1) the strong knowledge existent in sector of real state; 2) the expected synergies; 3) the need to leveraged the Sonae Shopping's; 4) following a strategy of focus; 5) hold market position; and 6) strong investment capacity.

**Table 7: Performance results of Sonae Retail (M€) from 2007 to 2010**

		2007	2008	2009	2010	a.g.r. (%)
Food		2368,4	2930	3106	3275	
			23,7%	6%	5,4	11,7%
	Continente	1133	1537	1568	1594	
			35,7%	2%	1,7%	13,1%
	Modelo	1113	1339	1458	1577	
			20,3%	8,9%	8,2%	12,5%
	Modelo Bonjour	116				
	Bom Bocado	5	9	18	26	
			80%	100%	44,4%	74,8%
	Well's	23	40	52	62	
			73,9%	30%	19,2%	41%
	Book.it		1	5	9	
				400%	80%	160%
		783	928	1132	1272	
Non-Food			18,5%	22%	12,4%	17,6%
	Worten	460,8	563	708	813	
			22,2%	25,8%	14,8%	20,9%
	Vobis	64,2	53	45	30	
			-17,4%	-15,1%	-33,3%	-21,9%
	Worten Mobile	6,9	11	45	30	
			59,4%	309,1%	-33,3%	111,7%
	Modalfa	91,2	102	115	125	
			11,8%	12,7%	8,7%	11%
	Zippy	16,6	28	39,3	38,5	
			68,7%	39,3%	38,5%	48,8%
	SportZone	143,1	170	205	228	
			18,8%	20,6%	11,2%	16,9%

Source: Author's, based on financial reports of the company.

It is important to point out the case of Vobis which experienced a very poor performance being presently in a merging process with Worten.

### 3.6.6. Sonae Sierra

The Sonae Sierra was created in 1989 with propose of helping Sonae Distribuição in the management of commercial galleries owned and seizing opportunities for expansion. Today Sonae Sierra is an international company, specialized in shopping centers, which

aims to become the leading operator of shopping centers and leisure, through a new and innovator approach, adopting an integrated business ownership, development and management activities (asset management and property management).

The company's strategy of "build and hold" encompasses an integrated vision of long-term investment ensuring that the value of shopping centers increases over time and being today one of the most important pillar of sustainability and value creation.

In late 2007, Sonae Sierra was present in Portugal, Spain, Italy, Germany, Greece, Romania and Brazil, owning 47 shopping centers with a total gross leasable area (GLA) of more than 1.85 million m<sup>2</sup>, holding a GLA under management more than 2.1 million m<sup>2</sup>.

In 2009, with the reorganization of the Sonae's Group, Sonae Sierra spun-off a new company, the Sonae RP (Property Retail), in order to management all properties related with retail. With this operation the objective was to maintain Sonae Sierra's focus on the management of the Shopping Centers, and create a new company to handle exclusive of the real estate.

Analyzing this operation through our model, the main drivers were: 1) follow the strategy of focus; 2) enhancing operational efficiency.

In 2010, we note a remarkable growth in international operations, especially in the Sonae Sierra Brazil, which leverage the global operating results (Table 8).

**Table 8: Performance results of Sonae Sierra (M€) from 2007 to 2010**

	2007	2008	2009	2010
	136,9	168,8	156	318
<b>Growth Rate (%)</b>		23,3	-7,6	103,8

*Source:* Author's, based on financial reports of the company.

### **3.6.7. Sonae Capital**

The Holding Sonae Capital was created in 2006, aggregating the company Sonae Turismo, SGPS, which started in 1994, and the company Spred, SGPS. These two companies followed the Sonae strategy of diversifying, applying the know-how in the retail, and real estate management, and the capacity of investment at disposal.

In this way the Sonae Turismo started to develop tourism operations. This was leveraged with partnerships, which enabled the management of hotels with integrated service delivery (SPA, Catering and Events, congress center, food court and parking)



and the management of health clubs. Later, the company entered in the business of Resort and Residential, which comprises the development (design and construction), management, marketing and sale of tourist resorts and residential developments of high quality. The company Spred, SGPS, SA, was initially created to specialize in investments through the Seed or Venture Capital, enabling interesting projects, or creating joint venture with specialized partners, increasing the corporation know-how and networking, leveraging the quick affirmation and growth in those activities sectors.

In 2010 Sonae Capital showed a decrease in operational profits, what can be explain by the atmosphere of distrust that has developed with the international financial crises.

**Table 9: Performance results of Sonae Capital (M€) from 2007 to 2010**

	2007	2008	2009	2010
	197,3	230,5	272,2	178,6
<b>Growth Rate (%)</b>		16,8	18,1	-34,4

Source: Author based on financial reports of the company.

### **3.6.8. SonaeCom**

Sonaecom was created in 1994 as a consequence of the strategy of diversification and expansion of Sonae, which lead to the investment in areas such telecommunications and information technology.

Today Sonaecom is a sub-holding being responsible for business segments related to Telecommunications, Media and Software and Systems Information (SSI), playing a huge role in the group, helping to exploit the existing synergies and potential company's growth.

According with annual report of 2007, the company achieved a market share of 13.5% of the Portuguese telecommunications market in late 2007. Today Optimus continues as the third operator in this market, trying to gain market share through a fresh and young image, relying with 2.9 million subscribers and a market share of 20% in late 2007.

Sonaecom is present also in the “fixed telecommunication” (telephony, ADSL, and IPTV), through the companies Novis and Clix, consolidating the position as a leading alternative operator in Portugal, offering voice, Internet and IPTV to their residential customer base. In late September 2007, Sonaecom Fixed achieved a market share of 15.4% in the broadband market and 21% of the market for voice telephony (the players in this market include PT, ZON-Multimedia, Vodafone, among others). Sonaecom is also present in the media sector, owning the newspaper Público, a national daily

newspaper of reference in Portugal. It is still present in the field of Software and Information Systems, having the company WeDo, which it is emerging as a significant supplier of systems integration and consulting, specialized in telecommunications and the global leader in revenue assurance skills. Revenue assurance is typically associated to telecommunications sector, helps the companies to improve profits, revenues and cash flows without influencing demand.

WeDo Technologies initiated its activity in 2001 as a provider of solutions to Business Assurance. Over the past eight years, the company has installed its solutions in more than 125 companies in 78 countries across five continents and has provided consulting services to over 100 operators through the successful division of Consulting, the Praesidium. Presently the company is located in Dublin (Ireland), Braga (Portugal), and Poznan (Poland). In 2007, the company acquired the Cape Technologies Limited (a company based in Ireland), becoming the world leader in integrated software for Revenue Assurance.

The SonaeCom owns other leading companies in the Portuguese context: 1) Mainroad, a leader in providing information technology services and solutions for IT Managed Services, IT Security, Business Continuity, IT Service Management and ITIL Consulting; 2) Bizdirect, whose minority shareholders are BPI and AITEC, being a reference in the marketing of multi-brand IT solutions; 3) Saphety, a company created in 2006 for wireline operations, which is a supplier of electronic invoicing services certification and security in B2B transactions (in 2008 was integrated in the B2B division of Bizdirect).

In a recent past SonaeCom had other successful spin-offs, most notably, Enabler. This company was created in 1997 from the autonomy of the Directorate of Information Systems Sonae Distribution, whose activities and experience in the design and development of information systems for Modelo Continente provided a solid base of knowledge of retail systems and processes. In June 2006, the company was acquired by Wipro Technologies yielding 41 Million Euros.

Applying our framework to analyze the main drivers of these spin-offs, we can point that all were motivated by: 1) the knowledge existent the company, earn with time and the necessity; 2) the expected synergies that was expected to get with group; 3) the expectation of leveraged the internal know-how in financial profits for the group; 4)

focus strategy, giving opportunity to the company create his own path; 5) hold market position and 6) strong investment capacity.

The dynamic behavior in the sector of Software and Information Systems, follows the group's strategy, focused on growing existing businesses, but also the awareness of new opportunities within the existing portfolio of businesses, or through acquisitions and investments in start-ups.

In the last quarter of 2010 a new business unit, called Optimus Connect, was created. This unit, dedicated to the development of emerging businesses in the area of M2M connections between machines, embraces the concept of "Internet of Things". Through a small highly specialized team, this unit aims to create new solutions with value in the area of mobile data and broaden the range of technological and commercial partnerships for specific sectors of activity. This business development is supported by an operational platform that allows with extreme efficiency the availability of communication solutions, great flexibility, and reduced cost in the area of M2M. This business area offers the customer an array of services and features with added value, which guarantees recognition and differentiation to the Optimus Connect. It is expected that the Optimus Connect could assert the market with greater penetration in the segment of transport, banking, health, energy, and water. This service was commercially launched in September of 2012.

**Table 10: Performance results of SonaeCom (M€) from 2007 to 2010**

Table 10.1 Performance Results of SonaeCom (M€) from 2007 to 2010										
		2007		2008		2009		2010		Average growth rate (%)
Mobile										
	Clients	2,9		3,2		3,4		3,6		7,5
	ARPU	18,2		16,8		14,8		13,7		-9
Optimus		153,7	619,4	142,4	629,1	166,7	607	185,5	592,8	-1.4
				1,6%		-3,5%		-2,3%		
Fixed		9,8	255,4	14	291,4	5,7	245,2	3,5	237,6	-1.6
				14,1%		-15,9%		-3,1%		
Media		-3,3	33,2	-3,2	32,4	8,4	52	8,5	25	2.1
				-2,4%		60,5%		-51,9%		
SSI		4,6	79,5	7,1	120,1	5,1	149,9	3,4	142,5	23,6
				51,1%		24,8%		-4,9%		

Source: Author based on financial reports of the company.

Despite the increase in the customer base, the operational performance had a slight decrease (Table 10). This can be explained by the ARPU decrease 9% per year between 2007 and 2010. This fact can be explain by the aggressiveness existent in the mobile market, by the fact that the market is highly saturated with rates of penetration over 100%, and also by the slowdown of the Portuguese economy. According to ICP-ANACOM at the end of 2nd quarter 2012 (2Q2012), there were approximately 16.6 million active mobile stations 2 associated with post-paid tariff plans, pre-paid plans and combined/hybrid plans at the end of 2nd quarter 2012 (2Q2012), falling 0.8 per cent compared to the previous quarter, but increasing 1.7 percent compared to 2nd quarter 2011).

In the fixed, the behavior was very similar, and can be explained for the same factors.

In the SSI, WeDo Technologies is the company that contributes the most, evidencing impressive growth rates, with the exception of the final year (2010). Currently, WeDo Technologies serves more than 150 customers in 80 countries. During 2011, international revenues represented 67.4% of its net sales, increasing 5.8% over 2010 with the strengthening of its presence in the regions of Africa and Asia. Mainroad, despite the market conditions, continues to growth, having increased the operational business volume. Between 2010 e 2011, the increase was of 17.5%.

On the global, and despite the economic conjecture, Sonaecom has maintained the operational results.

### **3.7. Technology spin-off as corporate performance instruments: a qualitative and quantitative synthesis**

Our empirical investigation was focused on four distinct corporations belonging to different market segments, with different trajectories, experiences, and entrepreneurial cultures. The investigation aimed in the identification of the conditions that give origin to the *spin-offs*, most particularly the technological spin-offs. Table A1 (in Appendix), presents a ‘quantitative’ summary of the evidence gathered from the corporations in study, being divided in three different sections, which reproduce the proposed theoretical framework of analysis: 1) the inputs that create the opportunity for the (technological) spin off; 2) the factors that influence in the decision process; and 3) the economic performance that the host company has from the spin off process.

The four companies analyzed were responsible for the creation of 40 spin offs, being 14 (35%) classified as technological spin offs. Galp was the only company that did not create spin-offs. As such, we might conclude that this company did not use the spin-off as a management instrument. In part, this might be explained by the fact that this company is an established incumbent, operating in a business sector that has a monopoly over several years.

Departing from Table A1 it was possible to quantify the process of spin off creation and use the data for statistical and econometric analysis based on the ‘model’ described in Chapter 1. Thus, in this section, and in a very preliminary stance, we assess the determinants of host company’s performance impact derived from each of its spin offs. Specifically, we evaluate which of the inputs (Human capital, Organizational identity, Market, R&D, Network partners) and drivers (Technology potential, Market trends, Defended market position, Investment, Localization, Human capital, Stakeholder structure, Complementarities) emerge as statistically relevant for this sample of spin offs analyzed, controlling for the spin off characteristics (experience in business and sector in which it operates) and type of spin off (technological versus other).

The descriptive statistics in Table 11 and Table A2 (in Appendix) show that only 35% of the spin offs analyzed can be classified as technological, and that these technological spin offs are mainly concentrated in the IT&Telecom (86% of the spin offs created in this sector are technological) and Energy (56% of the spin offs created in this sector are technological). In the Retail and Others (including here Construction, Wood) sectors no technological spin off was created. The most frequent inputs used in the process of spin off creation are the Market and network partners (in 72.5% and 70% of the spin offs it was observed the use of the market and network partners, respectively, to feed in the process of spin off creation). Human capital stands also as an important input for the majority (65%) of spin offs. The stakeholders structure (90%), complementarities among business segments of the host company (87.5%), and market trends (80%) are the three most critical decision drivers associated to the process of creation of the spin offs in study. Although contributing positively to the host company performance and its stakeholders returns, the spin offs analyzed do not impact greatly on these dimensions.

In terms of bivariate correlations (Table 11), the only determinants that evidence a significant and positive correlation with performance (company and stakeholders) are experience in business, the input ‘market’ and the driver ‘investment’.

**Table 11: Correlation matrix**

		Mean	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Performance	1. Corporate	,325	-3	3	1	,888***	-,162	,351**	,055	-,162	-,107	,402***	,096	,144	-,206	-,059	,078	,411***	,153	-,101	,187	,237
	2. Stakeholders returns	,250	-3	3		1	-,204	,349**	-,019	-,204	-,125	,467***	,118	,039	-,247	-,177	,077	,465***	,118	-,066	,236	,067
	3. Technological spin offs (TSO)	,350	,0	1			1	-,382**	,538***	1,000***	-,284*	-,135	,454***	-,206	,947***	,367**	-,480***	-,341**	,280*	,397**	-,280*	,119
	4. Experience in business	11,8	2	53				1	-,327**	-,382**	,309**	,383**	-,227	-,109	-,430***	-,335**	,326**	,245	,157	-,153	,210	-,272*
Inputs	5. Human capital	,650	,0	1					1	,538	-,348**	,018	,245	-,252	,568***	,026	-,663***	,011	,070	,610***	-,245	,040
	6. Technology	,350	,0	1						1	-,284*	-,135	,454***	-,206	,947***	,367**	-,480***	-,341	,280	,397***	-,280*	,119
	7. Organizational identity	,550	,0	1							1	,231	-,369**	-,044	-,337**	-,075	,263*	-,242	-,201	-,091	,369**	-,038
	8. Market	,725	,0	1								1	,019	-,281*	-,217	-,028	,037	,135	-,168	-,069	,355**	-,063
	9. R&D	,100	,0	1									1	,218	,430***	,167	-,218	,245	,444***	,231	,111	,126
	10. Network partners	,700	,0	1										1	-,169	,082	,310*	,320**	,036	-,454***	,145	,247
Drivers	11. Technology potential	,375	,0	1											1	,387**	-,394**	-,298*	,258*	,427***	-,258*	,137
	12. Market trends	,800	,0	1												1	,055	-,105	-,042	-,214	,042	,378**
	13. Defended market position	,300	,0	1													1	,137	-,036	-,711***	,218	,082
	14. Investment	,650	,0	1														1	,245	-,062	,280*	-,119
	15. Localization	,100	,0	1															1	,231	,111	-,126
	16. Human capital	,675	,0	1																1	-,231	-,262*
	17. Stakeholder structure	,900	,0	1																	1	,126
	18. Complementarities	,875	,0	1																		1

N= 40.

Legend: \*\*\*, \*\*, \* denote statistical significance at the 1%, 5% and 10% test level, respectively

Thus, at a first glance, none of the relevant inputs and drivers identified by the literature as key for host company performance derived from the creation of spin offs, namely, technological spin offs – e.g., human capital, R&D, networks, complementarities – seem to matter in our sample.

We further observe from the estimates of the Pearson correlation coefficient that, on average, technological spin offs are positively and significantly associated with human capital, R&D and technology inputs. Regarding the latter the correlation coefficient is 1, which means that all technological spin offs (as expected) have technology as an input. In terms of the technological spin off decision process, the technological potential and human capital emerge as the key drivers.

Given the relatively high correlation among inputs and drivers, in the estimation of the econometric models (Table 12) we compute estimations for host company performance derived from spin off creation separating inputs (Models 1-4) and drivers (Models 5-9). Technology input was not included in the estimations as it was perfectly correlated with the variable Technological Spin Offs (TSO). Similarly, due to problems of multicollinearity we estimate several versions of each group of models including in some the variable TSO but not the dummy for the sector (1 if it belongs to Energy sector and 0 otherwise) and the reverse. In the group of models respecting the drivers there was the need to estimate one additional model given the high correlation between the drivers ‘human capital’ and ‘defended market position’.

The models’ goodness of fit is adequate for micro data, with the adjusted  $R^2$  varying between 0.21 and 0.39, which means that about 21%-39% of the variance of the company’s performance (derived from the spin offs process) is explained by the variables included in the models.

Estimations yield interesting outcomes. First, the input ‘market’ is the one that in isolation impact more on host company performance.<sup>5</sup> Human capital and R&D failed to emerge as significant determinants of host company performance. In terms of drivers, the most significant variables are ‘investment’ and ‘complementarities between host company business segments’.

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<sup>5</sup> Estimations for the stakeholders returns provided very similar results, thus we opted for not presenting the outputs here. This was quite expected given the very high correlation (0.88) between company’s performance and stakeholders returns (see Table 11).

**Table 12: Technological spin offs and host corporations' economic performance (OLS regression estimation models)**

		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
<b>Inputs to the spin off process</b>	Human capital	0.145	-0.077	-0.075	0.157					
	Organizational identity	-0.168	0.230	0.229	-0.043					
	Market	0.265	0.336**	0.335**	0.304*					
	R&D	0.096	-0.139	-0.135	-0.118					
	Network partners	0.156	0.189	0.188	0.065					
<b>Drivers to the spin off process</b>	Technology potential					-0.179	0.003	-0.159	-0.291	-0.607
	Market trends					0.068	0.013	0.094	0.089	-0.015
	Defended market position						-0.093			
	Investment					0.307**	0.306**	0.125	0.135	0.285*
	Localization					0.1013	0.143	0.001	-0.017	
	Human capital (HC)					0.1966		0.173	0.173	0.099
	Stakeholder structure					-0.1215	-0.141	0.185	0.200	0.033
	Complementarities					0.427**	0.383*	0.297	0.296	0.396*
	Technological spin off (TSO)	-0.123		-0.005		0.126			0.142	
Interaction TSO*Inputs(Drivers)	TSO*Input/Driver HC				-0.357					0.586*
	TSO*Energy				0.537**					0.111
Characteristics of the spin off	Business experience (ln)	0.226**	0.286***	0.285***	0.217**	0.246**	0.251**	0.346***	0.338***	0.186*
	Sector (Energy=1; Others=0)		0.694***	0.692***				0.402**	0.406**	
Constant		0.628	0.085	0.089	0.603	0.231	0.453	-0.147	-0.144	0.384
N		40	40	40	40	40	40	40	40	40
R <sup>2</sup> adjusted		0.209	0.386	0.366	0.274	0.241	0.209	0.344	0.325	0.354

*Note:* Excluding Business Experience which represents the years each spin off is in business (in logarithm), all the remaining independent variables are dummies which assume the value 1 when the given input/driver is present in the spin off creation/decision process and 0 otherwise.

*Legend:* \*\*\*, \*\*, \* denote statistical significance at the 1%, 5% and 10% test level, respectively.



It is interesting to note that although in isolation technological spin offs do not influence the performance of the host company, when interacted with the sector (energy) we succeed in finding that technological spin offs from the energy sector do contribute significantly and positively to the host company performance. Moreover, in terms of drivers, technological spin offs that sustain its decision process on human capital related drivers tend, on average, to impact significantly on host company's performance. Thus, human capital driver stands as a key determinant but only when associated with technological spin offs.

In terms of spin offs characteristics, it is clear that business experience and sector matters for the impact that spin off creation process has on host company's performance. Indeed, our estimation results reflect that, on average, all other factors remaining constant, a more experienced spin off tends to yield better performances. The same happens when we are considering a spin off from the energy sector.

## Conclusions

The goal of our investigation was to seek the determinants that impel the creation of a technology spin-off, and the factors behind the success/failure of technology spin-off in terms of value generation.

During the current thesis, was conducted a critical review of the existent literature on the spin-off's topic, with special incidence on the impact of technological discovery in the process and the opportunity that could come to incumbent companies. From the critical review, it was proposed a framework that intends to explain the spin-off's process and the decision that lead to spin-off's creation.

Our investigation was focused on the following companies: Martifer, EDP-Energias de Portugal, Galp-Energia, and Sonae-SGPS. They are firms that belong to the Portuguese Stock Index (PSI), with distinct characteristics, and operating in different economic sectors.

The data was mainly drawn from the Annual Reports of the selected companies. Through a content analysis of the strategies adopted by these firms we were able to perform an in depth qualitative and a preliminary quantitative analysis of the host company's economic performance.

From the analyses performed it was clear that behind the spin-off's creation, whether it be technological or not, stands the consideration by top management of the spin-off as management instrument at their disposal. But more important, is the top management's belief that this instrument can unleash the economical value, in a business opportunity, and in this way increase the economic value of the organization.

From the descriptive analysis, we concluded that the key inputs associated to technological spin-offs are: Human Capital; Technology; and R&D. Technology opportunity in particularly emerged, as expected, as a mandatory factor. These findings are aligned with the scientific literature presented in the Chapter 1. Authors like Zahra and George (2002) or Agarwall *et al* (2004), suggested that employees with superior knowledge capabilities are more likely to potentiate technology. This evidence is enlightened by the positive (and significant) correlation between the human capital input variable and the capacity of discover or mastering technology through the input technology variable.

Furthermore, the existence of positive influence of the R&D in the technological spin-off's, is also in line with literature. Authors like Zahra (1996) or Rohrbeck *et al.* (2009), had identified that R&D could transfer to the company know-how, and outcomes in the form of product evolutions or new technology breakthrough.

It is also possible to affirm, that the decisions drivers that most significantly foster a technological *spin-off's* are: Technology Potential; Defend Market position; Human Capital; and Market Trend. These findings are also aligned with the scientific literature. Authors like Clarysse *et al* (2005), Zahra (1996) Chesbrough (2003), Agarwall *et al.*(2004) or Narayanan *et al.*(2009), argue that the technology spin-off opportunity appears at the front of the a technology potential, that have high degree of commercial potential, but do not belong to the main core business. Moreover, it was possible to identify a strong positive correlation between the input variable R&D and the driver technology potential. These facts are once more aligned with the scientific literature. Authors like Zahra (1996), Arora *et al.*(2001) or Agarwall *et al.* (2004), suggested that R&D could unlock new business opportunities. This dimension is so critical that according with the authors companies tend to invest in monitoring technological developments trying to identify possible threats and opportunities.

Nevertheless, no statistical evidence exists that could suggest that a technological spin-off has a superior economic benefit to the host company by comparison to a 'standard/norma' *spin-off*. Both the economic performance and shareholder returns fail to be significantly correlated with technological spin off type.

Economic performance is, in contrast, directly related with the market business segment, revealing that a business spin-off is leveraged essentially by the market input. It was also observed a strong correlation between the economic performance and the Investment. For other hand, the investment have a negative relationship with the technological *spin-off's*, what can lead to the conclusion that a business spin-off's success have a strong dependency on the investment made. These dynamic was already been identify with Zahra et al. (1999), who argued that markets with high degree of rivalry decrease in long run the R&D expenses, diminishing the technology *spin-off*.

Sector matters in the process of creation of (technological) spin offs. In our sample, only the sectors 'Energy' and 'IT-Telecommunications' created technology spin-offs. In contrast, Retail' and the sector 'Other' do not showed any *spin-off* creation. These different dynamics lead to the conclusion that technology has strong relationship with

sector activity. 'IT and Telecommunications' showed a strong dynamic in technological spin off generation, being the technology spin-off's percentage of total spin offs creations of 86%. In the sector of 'Energy' the percentage is lower, but even so of 57%. The strong dynamics existent in these sectors can be explain by the fact that are sectors where for being competitive one must possess strong know-how capabilities.

The causality analysis shows that (high levels of) business experience and sector of activity matter for the impact of spin offs on host company performance. Moreover, although technological spin off per se do not determine high host company performance, these latter type of spin offs do impact on host company performance when sustained in a human capital driver. Finally, the existence of complementarities among host company business segments and the investment driver stand as critical explanatory factors for the impact of spin offs on host company performance.



The Spin-off is certainly an instrument for generating economic value, available to top management, and as such should be used throughout in all splendor since allowed the company to growth and to diversity. This instrument has the advantage to maintain the company's focus on their core business. In the fact we can consider the spin-off as strategic management instrument, allowing expansion and growth, reducing exposure to crises in a particular business segment or market. The Spin-off can be consider as an instrument of renewal, where with the right condiments is the key to open doors to new value propositions, through new innovative products.

Although the present study has its merit of analyzing a rather unexplored and complex issue where the access to relevant data is paved with difficulties, a quantitative analysis based on international financial databases like the Capital IQ or Wharton Research Data Services (WRDS), could enrich and complement the analysis present here providing in this way an enlarged data set with relevant international financial information which could bring additional value and further clarifications on the theme.

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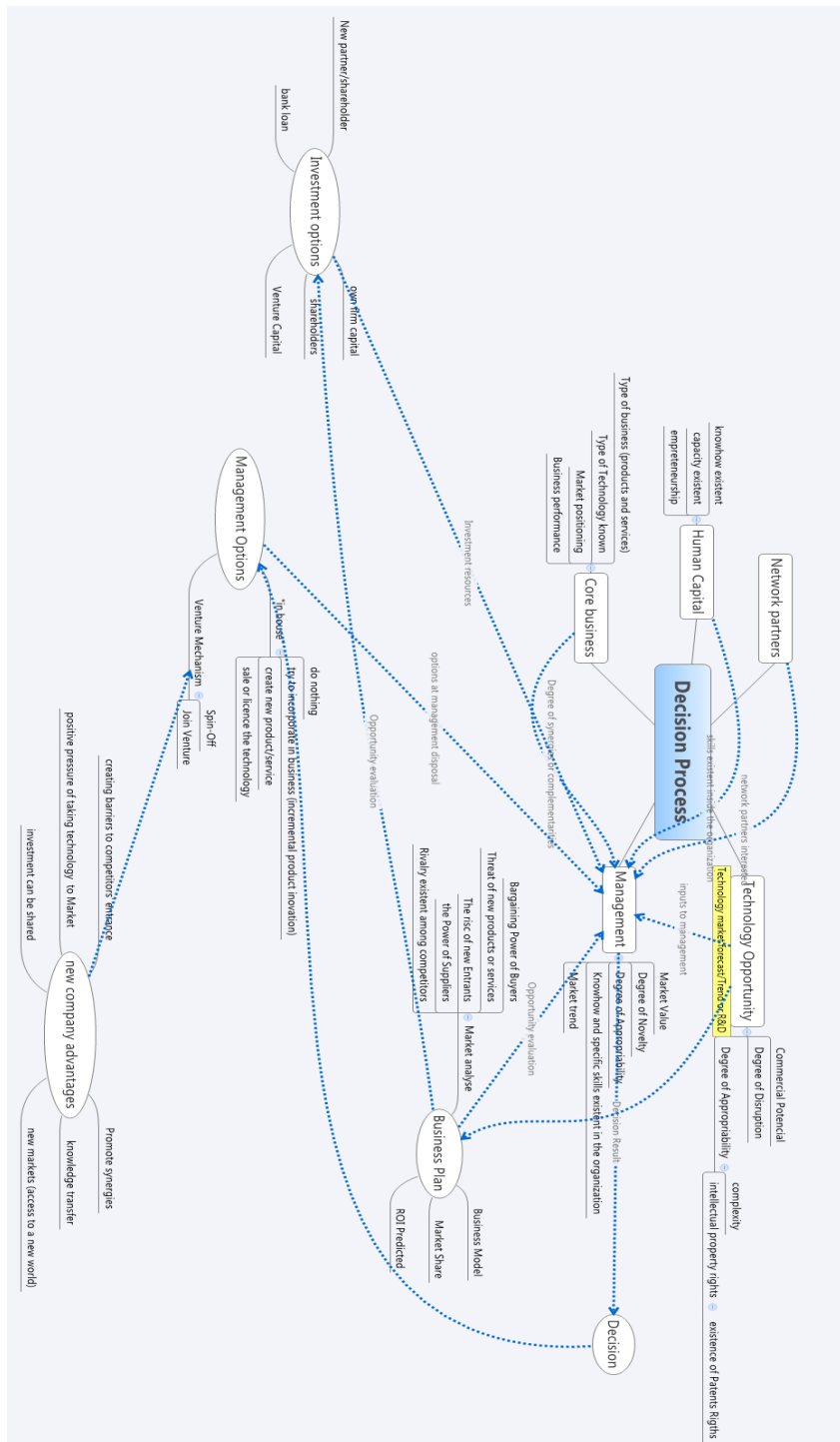
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## Appendix 1: Decision Process - Map mind



## Appendix 2: Corporate spin-offs analyses

Table A 1: Corporate spin offs, inputs, main drivers and outcomes: a synthesis

	Creation Year	Sector (Business segment)	Geographical location	Technological	Spin off inputs							Drivers - Decision Process							Performance	
					Human Capital	Technology	Organizational identity	Market	R&D	Network partners	Technology potential	Market trends	Defended market position	Investment	Localization	Human capital	Stakeholder structure	Complementarities	Stakeholders returns	Economic performance
Martifer	Martifer Aluminios	2002	Construction	Portugal/North	No			✓						✓		✓	✓		+	-
	Martifer Energy Systems	2004	Energy	Portugal/North	No	✓										✓		✓	-	-
	REPower Portugal	2007	Energy	Portugal/North	Yes	✓	✓	✓			✓	✓				✓		✓	+	+
	PowerBlade	2006	Energy	Portugal/North	Yes	✓	✓			✓	✓	✓		✓		✓		✓	-	-
	Martifer Renewables	2005	Energy	Portugal/North	Yes	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	✓	+	+
	Martifer Solar	2006	Energy	Portugal/North	Yes	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	✓	+	+
	HomeEnergy	2008	Energy	Portugal/North	Yes	✓	✓			✓	✓	✓				✓			--	-
EDP - Energias de Portugal	EDP – Gestão e Produção de Energia	1994	Energy	Portugal/Center	No	✓		✓		✓			✓	✓			✓	✓	+++	+++
	Naturgas	2003	Energy	Spain	No	✓		✓		✓		✓		✓			✓	✓	+	++
	EDP – Serviços Universais	2006	Energy	Portugal/Center	No	✓		✓				✓		✓		✓	✓	✓	+	+
	EDP Gás Serviço Universal	2008	Energy	Portugal/Center	No	✓		✓				✓		✓		✓	✓	✓	+	+
	InovGrid	2009	IT	Portugal/Center	Yes	✓	✓			✓	✓	✓					✓	✓	---	---
	EDP Renewables	2007	Energy	Spain	Yes	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	+++	+++
	Horizon Wind Energy	2008	Energy	USA	Yes	✓	✓			✓	✓	✓		✓	✓	✓	✓	✓	+	++
Galp	WindPlus	2009	Energy	Portugal/North	Yes	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓	--	--
	EDP Mop	2010	Energy	Portugal/Center	No	✓				✓	✓	✓	✓	✓		✓	✓	✓	-	-
Galp		1999	Energy	Portugal/Center	No														+++	+++

(...)

		Creation Year	Sector (Business segment)	Geographical location	Technological	Spin off inputs					Drivers - Decision Process							Performance			
					Human Capital	Technology	Organizational identity	Market	R&D	Network partners	Technology potential	Market trends	Defended market position	Investment	Localization	Human capital	Stakeholder structure	Complementarities	Stakeholders returns	Economic performance	
Sonae	Sonae Industria	1959	Wood	Portugal/North	No		✓	✓					✓	✓	✓	✓	✓		+	+	
	Sonae Distribuição																				
	Continente	1985	Food-Retail	Portugal/North	No			✓		✓		✓	✓	✓			✓	✓	++	++	
	Modelo		Food-Retail	Portugal/North	No			✓		✓		✓	✓	✓			✓	✓	++	++	
	Modelo Bonjour		Food-Retail	Portugal/North	No		✓	✓		✓		✓	✓	✓			✓	✓	-	-	
	Bom Bocado		Food-Retail	Portugal/North	No		✓	✓		✓		✓	✓	✓			✓	✓	-	-	
	Well's		Non Food-Retail	Portugal/North	No		✓			✓						✓	✓	✓	-	-	
	Book.it		Retail	Portugal/North	No		✓			✓		✓				✓	✓	✓	-	-	
	Worten	2001	Retail	Portugal/North	No		✓	✓		✓		✓	✓				✓	✓	++	+	
	Vobis		Retail	Portugal/North	No		✓	✓		✓		✓	✓				✓	✓	--	--	
	Worten Mobile		Retail	Portugal/North	No		✓	✓		✓		✓	✓				✓	✓	-	+	
	Modalfa	1995	Retail	Portugal/North	No		✓	✓		✓		✓	✓	✓			✓	✓	+	+	
	Zippy	2004	Retail	Portugal/North	No		✓			✓		✓	✓	✓			✓	✓	+	+	
	SportZone	1997	Retail	Portugal/North	No		✓			✓		✓	✓	✓			✓	✓	+	+	
	Sonae Sierra					No															
	Sonae Sierra	1989	Shopping Center	Portugal/North	No	✓		✓	✓		✓				✓		✓	✓	✓	+	++
	Sonae RP		Property Retail	Portugal/North	No	✓		✓	✓		✓				✓		✓	✓	✓	+	++

(...)

		Creation Year	Sector (Business segment)	Geographical location	Technological	Spin off inputs							Drivers - Decision Process							Performance	
					Human Capital	Technology	Organizational identity	Market	R&D	Network partners	Technology potential	Market trends	Defended market position	Investment	Localization	Human capital	Stakeholder structure	Complementarities	Stakeholders returns	Economic performance	
Sonae Capital																					
Sonae Turismo			Tourismo	Portugal/North	No	✓		✓	✓		✓		✓		✓		✓	✓	✓	+	+
Spred			Investments	Portugal/North	No	✓		✓	✓		✓				✓		✓	✓		+	-
SonaeCom																					
Optimus		1998	Telecommunications	Portugal/North	No	✓		✓	✓		✓		✓		✓	-	✓	✓	✓	+	++
Publico		1990	Media	Portugal/Center	No	✓		✓	✓				✓		✓		✓	✓		-	-
bizdirect		2001	IT	Portugal/North	Yes	✓	✓	✓	✓			✓	✓				✓	✓	✓	-	-
mainroad		2003	IT	Portugal/North	Yes	✓	✓	✓	✓			✓	✓				✓	✓	✓	-	-
Wedo		2001	IT	Portugal/North	Yes	✓	✓	✓	✓			✓	✓				✓	✓	✓	+	+
saphety		2006	IT	Portugal/North	Yes	✓	✓	✓	✓			✓	✓				✓	✓	✓	-	-
Enabler		1997	IT	Portugal/North	Yes	✓	✓	✓	✓			✓	✓				✓	✓	✓	+	+

Legend:

✓ Verified;

Performance: --- very weak; -- weak; - slightly weak; + slightly strong; ++ strong; +++ very strong

Source: Author based on financial reports of the company.

**Table A 2: Some descriptive statistics on corporate spin offs' types and economic performance, by sector**

sector_g		TSO	Economic performance	P_Stakeholders returns
Energy	Mean	,57	,64	,43
	N	14	14	14
	Std. Deviation	,514	1,598	1,604
IT&Telecom	Mean	,86	-,29	-,43
	N	7	7	7
	Std. Deviation	,378	1,704	1,512
Retail	Mean	,00	,50	,29
	N	14	14	14
	Std. Deviation	,000	1,401	1,383
Other	Mean	,00	-,20	,60
	N	5	5	5
	Std. Deviation	,000	1,095	,894
Total	Mean	,35	,33	,25
	N	40	40	40
	Std. Deviation	,483	1,492	1,428

Source: Author based on financial reports of the company